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SUMMER SESSION
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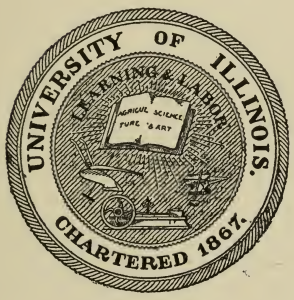

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UNIVERSITY OF ILLINIOS

CALENDAR

SUMMER SESSION

June 21, 1909, Monday	Registration Day.
July 30, Friday	Examination for six-weeks course and for all who cannot stay the full session.
Aug. 19 and 20, Thursday and Friday	Final Examinations.

First Semester

Sept. 15, 1909, Wednesday	Entrance Examinations begin.
Sept. 20 and 21, Monday and Tuesday	Registration Days.
Sept. 22, Wednesday	Instruction begins.

REGISTRATION OF STUDENTS

'94-'95	810
'95-'96	855
'96-'97	1075
'97-'98	1585
'98-'99	1825
'99-'00	2234
'00-'01	2505
'01-'02	2950
'02-'03	3288
'03-'04	3594
'04-'05	3729
'05-'06	4074
'06-'07	4316
'07-'08	4743
'08-'09	4900

OFFICERS OF THE SUMMER SESSION

1909

UNIVERSITY COUNCIL OF ADMINISTRATION

EDMUND JANES JAMES, Ph.D., LL.D., President of the University.

THOMAS JONATHAN BURRILL, Ph.D., LL.D., Vice President.

DAVID KINLEY, Ph.D., LL.D., Dean of the Graduate School.

EUGENE DAVENPORT, M.Agr., Dean of the College of Agriculture.

OLIVER ALBERT HARKER, A.M., Dean of the College of Law.

EDGAR JEROME TOWNSEND, Ph.D., Dean of the College of Science.

EVARTS BOUTELL GREENE, Ph.D., Dean of the College of Literature and Arts.

WILLIAM FREEMAN MYRICK GOSS, D.Eng., Dean of the College of Engineering, Director of the School of RailwayEngineering.

THOMAS ARKLE CLARK, B.L., Dean of Undergraduates. Director of the Session.

LILY GAVIT KOLLOCK, Ph.D,. Dean of Women.

WILLIAM EDWARD QUINE, M.D., LL.D., Dean of the College of Medicine.

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*HERBERT JEWETT BARTON, A.M., Professor of the Latin Language and Literature. Dean of the Session.

SAMUEL WALKER SHATTUCK, C.E., Comptroller. Office, Library Building.

WILLIAM LOW PILLSBURY, A.M., Registrar, Office, Library Building.

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*Professor Barton will have charge of all matters relating to the conduct of the session.

FACULTY

ABBOTT, EDWINA, Assistant in Psychology. *307 East John street, C.*

ALDRICH, MORTON ARNOLD, Ph.D., Professor of Economics and Sociology, Tulane University.

ATKINSON, ELIZABETH ELLIOTT, Assistant in Physical Training.

BAGLEY, WILLIAM CHANDLER, Ph.D., Professor of Education. *711 West Hill street, C.*

BALDWIN, EDWARD CHAUNCEY, Ph.D., Assistant Professor of English Literature. *1002 South Lincoln avenue, U.*

BALKE, CLARENCE WILLIAM, Ph.D., Associate in Chemistry. *805 Nevada street, U.*

BARTOW, DANIEL OTIS, B.S., Instructor in Secondary School Agriculture. *919 Nevada street, U.*

BARTON, HERBERT JEWETT, A.M., Professor of Latin Language and Literature. *406 West Hill street, C.*

BIRDSALL, LUTHER EARLE, Professor of Law, University of North Dakota, Grand Forks.

BORGER, RÖBERT LACEY, Ph.D., Instructor in Mathematics. *508 West High street, U.*

BROWNSON, HOWARD GRAY, A.M., Instructor in Economics. *310 East Green street, C.*

CASPER, SHIELDS, Instructor in Foundry. *1007 North Walnut street, C.*

CHILES, JAMES ALBURN, Ph.D., Instructor in German. *608 West California avenue, U.*

CLUTE, WILLARD NELSON, Instructor in Botany, Joliet Township High School, *Joliet, Illinois.*

COLVIN, STEPHEN SHELDON, Ph.D., Professor of Psychology; Acting Director of School of Education. *910 West Oregon street, U.*

CONGER, JOHN LEONARD, Ph.D., Professor of History and Government, Knox College, *Galesburg, Illinois.*

COSGROVE, TERENCE BURNS, A.M., LL.M., Instructor in Law. *802 South Mathews avenue, U.*

CROW, BARBARA, Assistant in Physical Training.

DENTON, WILLIAM WELLS, A.B., Assistant in Mathematics. *709 West High street, U.*

DERICK, CLARENCE GEORGE, S.B., Assistant in Organic Chemistry. *606 East John street, C.*

DODGE, DANIEL KILHAM, Ph.D., Professor of English. *806 West Green street, C.*

EGAN, JAMES EVERETT, A.B., Graduate Assistant in Chemistry. *1304 West Clark street, U.*

ELLIS, FREDERICK, Instructor in Wood Shop. *511 West Illinois street, U.*

ENGER, MELVIN LORENIUS, B.S., Instructor in Theoretical and Applied Mechanics. *611 West Illinois street, U.*

FLEMING, VIRGIL, R, B.S., Instructor in Theoretical and Applied Mechanics. *306 East Chalmers street, C.*

FOLSOM, JUSTUS WATSON, Sc.D., Assistant Professor of Entomology. *607 West White street, C.*

FORD, GUY STANTON, Ph.D., Professor of Modern History. *805 South Goodwin avenue, U.*

GILL, JAMES HERBERT, M.E., Assistant Professor of Machine Construction; in charge of Mechanical Department Shops. *410 West Illinois street, U.*

GLEASON, HENRY ALLAN, Ph.D., Instructor in Botany. *511 East John street, C.*

GOBEN, LOMA WILLIAM, Assistant in Machine Shop. *703 South Coler avenue, U.*

GORDON, HUGH B, A.B., Assistant in Chemistry. *105 East Healy street, C.*

GREEN, FREDERICK, A.B., LL.B., Professor of Law. *University Club, U.*

GROSS, ALFRED OTTO, Assistant in Botany. *Young Men's Christian Association House, C.*

GUILD, THACHER HOWLAND, A.M., Associate in English. *1010 West Oregon street, U.*

HACHMEISTER, HENRY WILLIAM, B.S., Instructor in Swimming. *208 East Green street, C.*

HALLIDAY, ERNEST MILTON, A.B., LL.B., Associate in English (Public Speaking). *1010 West Oregon street, U.*

HANA, LEO GREGORY, Instructor in Physical Training. *311 East Green street, C.*

HARBARGER, SADA ANNIS, A.B., Assistant in English. *507 East Green street, C.*

HAYES, EDWARD CAREY, Ph.D., Professor of Sociology. *906 West California avenue, U.*

HOLLISTER, HORACE ADELBERT, A.M., Assistant Professor and High School Visitor. *1001 South Third street, C.*

HOLMES, WILLIS B., Ph.D., Associate in Chemistry. *1005 South Fifth street, C.*

LANHAM, EDGAR THOMAS, Instructor in Forge Shop. *309 North Race street, U.*

LARSON, LAURENCE MARCELLUS, Ph.D., Assistant Professor of History. *1117 Euclid street, C.*

LYTLE, ERNEST BARNES, Ph.D., Instructor in Mathematics. *924 West Illinois street, U.*

McCONN, CHARLES MAXWELL, A.M., Acting Principal of the Academy. *1002 West California avenue, U.*

McMASTER, CARLOS LENOX, C.E., Associate in General Engineering Drawing; Assistant to the Dean of Undergraduates. *Y. M. C. A. Hall.*

MEYER, GEORGE HENRY, A.M., Assistant Dean, College of Literature and Arts; Assistant Professor of German Language and Literature. *1104 West Illinois street, U.*

NICKELL, LLOYD FRANCIS, Assistant in Chemistry. *405 East Green street, C.*

NORTHRUP, ELLIOTT JUDD, A.B., LL.B., Associate Professor of Law. *907 West California avenue, U.*

OLIVER, THOMAS EDWARD, Ph.D., Professor of Romance Languages. *912 West California avenue, U.*

OWEN, ARTHUR LESLIE, A.B., Assistant in Romance Languages. *912 West California avenue, U.*

PEASE, ELVA MAUDE, Assistant in Physical Training.

PETERS, AMOS WILLIAM, Ph.D., Associate in Zoology. *1008 West Green street, U.*

PINCOMB, HELENA MAUDE, B.S., Instructor in Household Science for Secondary Schools. *712 West Oregon street, U.*

SCOTT, FRANK WILLIAM, A.M., Associate in English. *1010 West Oregon street, U.*

SCOTT, ROBERT BRUCE, Ph.D., Assistant Professor of Political Science, University of Wisconsin, *Madison, Wisconsin.*

SCROGGIN, DAVID LEONARD, Instructor in Machine Shop. *707 West Wasington street, U.*

STEPHENSON, EDWARD BEATTIE, M.S., Assistant in Physics. *310 East Green street, C.*

STIFLER, WILLIAM WARREN, A.M., Assistant in Physics. *310 East Green street, C.*

TANQUARY, MAURICE COLE, A.M., Assistant in the State Entomologist's Office. *402 East Stoughton street, C.*

THOMAS, FRANK WATERS, A.B., Instructor in Latin and Greek in the Academy. *613 East Poplar street, U.*

THOMPSON, CHARLES MANFRED, Instructor in Mathematics in the Academy. *512 East Stoughton street, C.*

TIETJE, ARTHUR JERROLD, A.M., Assistant in English. *812 West Hubbard street, U.*

WAHLIN, GUSTAF ERIC, Ph.D., Instructor in Mathematics. *1308 West Stoughton street, U.*

WATSON, FLOYD ROWE, Ph.D., Assistant Professor of Physics. *907 West California avenue, U.*

WIEHR, JOSEF, Ph.D., Instructor in German. *905 West Green street, U.*

WILLIAMS, ELMER HOWARD, A.M., Instructor in Physics. *708 West Stoughton street, U.*

YOUNG, JOHN WESLEY, Ph.D., Assistant Professor of Mathematics. *804 West Green street, U.*

GENERAL STATEMENT

The Summer Session of the University of Illinois for the year 1909 will open June 21 and close August 20, making a term of nine weeks. This is equivalent to one-fourth of the regular University year, and credit will be given on that basis. The opening day will be devoted to registration.

Examination for those desiring credit for the work will be held on Thursday and Friday, August 19 and 20. Examination in some of the courses may be had at the end of six weeks by those who find it impossible to remain during the whole session. Instruction begins on June 22 and closes on August 18.

The exact amount of credit given for each course is stated in connection with the outline of courses given later in this announcement. Students will be allowed to carry nine hours of work.

PURPOSE

The purpose of the Summer Session is to give to those who cannot well attend during the regular college year, an opportunity to do advanced work. Leading instructors, from the University corps of teachers have charge of the courses, so that the character of the instruction offered is as high as that during the regular college year.

Most of the courses are intended for students who wish to pursue work for a bachelor's or a master's degree in the University, and are so arranged that students may specialize in a single subject, if it seems desirable, devoting their whole time to it. A few courses are for students who are preparing to enter the University, or who wish to make up deficiencies in work of a preparatory grade. Some courses, also, have been especially arranged for the purpose of aiding those who teach or who wish to prepare themselves to teach in high schools, academies, and other schools.

FEES

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee in some courses is

charged for material used. Any single course may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken, a single course being understood to mean not more than two and one-half hours.

LAW—A tuition fee of fifteen dollars ($15) will be charged all students taking full work in law for ten weeks, $7.50 for either half. No scholarships will be given for work in law, and the scholarships offered teachers for the Summer Session will not be accepted in the College of Law in lieu of the fee. The University has not been authorized to grant such scholarships for professional study. Single courses in law may be taken upon payment of a proper fee to be determined in proportion to the number of hours of instruction in that course.

ACADEMY—An additional fee of five dollars ($5.00) will be charged all students registering for one or more Academy subjects. Scholarships will not cover the Academy fee.

A permit to attend special lectures may be obtained from the Dean of the Session without the payment of any fee.

SCHOLARSHIPS

In accordance with an action of the Board of Trustees of the University all high school teachers in Illinois, and all other teachers in the State who are able to matriculate in the University, are entitled to a free scholarship in the Summer Session of the University. Teachers desiring these scholarships should present to the Director before June 1, 1909, a statement from the board of education of the school in which they were employed to the effect that they have been teaching during the past year, and they will be awarded a scholarship in the Sumer Session. Blanks for

this purpose may be had by addressing the Director. Teachers wishing scholarships on the ground of their ability to matriculate should present their credentials to the Registrar before June 1, 1909.

REGISTRATION

Students will present themselves for registration at the Library on Monday, June 21, between the hours of 8 a. m. and 4 p. m. After consultation with the instructors in the various departments, study blanks will be filled out, submitted to the Dean for approval, and filed with the Registrar. Students who wish courses to count for a higher degree should consult with Dean Kinley of the Graduate School. The tuition and other fees are due upon registration.

ASSEMBLIES

During the first week of the Summer Session an assembly will be held which all the students and members of the faculty are expected to attend, and at which the opportunities and advantages of summer work in the University will be explained. Following the custom of last summer session these assemblies will be held with some regularity and probably on Wednesday afternoon.

INCIDENTAL EXERCISES

Besides the regular exercises the Summer Session provides a considerable number of incidental exercises, which in themselves are of no little value and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students, one during the first week of the Session and another nearer its close; athletic events gotten up by the students, and the incidental lectures given by members of the

University faculty. During the session of 1909 two such lectures will be given each week. The Physics Lecture Room is used in order that the lantern may be utilized in the illustration of the lectures. The following have already ben arranged for:

LECTURES

Professor C. M. Moss—Athens and Her Monuments

Professor W. C. Bagley—The Scientific Spirit in Education.

Professor D. K. Dodge—Hamlet.

Dean E. B. Greene—The Impeachment of President Andrew Johnson.

Professor N. C. Ricker—Development of Agriculture.

Dean Eugene Davenport—Vocational Education.

Professor Joel Stebbins—Life in a Mountain Observatory.

Professor S. W. Parr—A Talk on Coal.

Professor H. J. Barton—The Roman Forum.

Professor S. S. Colvin—Illusions.

Professor T. E. Oliver—Finland.

Professor G. S. Ford—Queen Louise of Prussia.

Professor H. A. Hollister—Socializing Influences in High Schools.

EXPLANATION OF ABBREVIATIONS USED

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular college year.

"A" prefixed to the description of a course means that it is offered in the Academy.

The number in parenthesis after each course indicates the number of hours' credit given.

OUTLINE OF COURSES

GRADUATE WORK.

Graduate students will not be accepted for work in any department unless a specific statement of the work open to graduate students in that department is given in connection with the description of courses.

AGRICULTURE

Mr. Barto

S 1. Secondary School Agriculture.—This course is arranged for teachers in high schools, especially for the science teachers in these schools, who wish to make preparation for teaching agriculture.

The State University offers exceptional advantages to teachers who wish to do this work in the Summer Session since the experiment plots, farm crops, farm machinery, farm methods, farm buildings, orchards, gardens, silos, dairy, herds, flocks, green houses, laboratories and library,—the whole equipment of the College of Agriculture,—is at the service of the students of agriculture for instructional use. *Daily; two periods; first six weeks.* (1½).

S 2. Common School Agriculture.—This course is especially designed for teachers of the grammar grades and of country schools who wish to get suggestions and training that will help them in teaching agriculture in their schools.

Particular attention will be given to the preparation of simple exercises in the study of soils and seeds and in problems dealing with germination and plant growth.

The work in this course will be related as closely as is practicable to the work in agriculture given in the State Course of Study for the Common Schools of Illinois. *Daily; two periods; first six weeks.* (1½).

BOTANY

Dr. Gleason, Mr. Clute

Courses S E 1 and S E 2 have been discontinued.

S 3. Elementary Physiology.—A study of the more important physiological processes in the plant. *Daily; two periods;* (2½). Assistant Professor Hottes.

Prerequisite: Entrance credit in botany or its equivalent. (Not given in 1909).

S 4. Technique and Elementary Histology.—Methods of collecting and preserving material for the class room, and the preparation of permanent slides and museum specimens. A study of the minute anatomy of the vegetative organs. *Daily; two periods;* (2½). Assistant Professor Hottes.

Perequisite: Entrance credit in botany or its equivalent. (Not given in 1909).

S 5. Systematic Botany.—The course is devoted exclusively to flowering plants and includes laboratory work on the identification of species and field studies of the common trees and shrubs. Studies are also made upon systems and principles of plant classification and upon the characteristics of important families. *Daily; two periods;* (2½). Dr. Gleason, Mr. Clute.

Prerequisite: Entrance credit in botany or its equivalent.

S 6. Ecology.—Lectures and field work on ecological factors, their action upon plants, and the structure and functions of typical plant associations. The course is about equivalent to course 17 of the second semester. *Daily; two periods;* (2½). Dr. Gleason.

Prerequisite: Entrance credit in botany or its equivalent.

S 7. Teachers' Course.—This course is intended for those who are to teach the subject in secondary schools and includes both scientific and pedagogic studies. Lectures and laboratory work are devoted to: (1) such plants and such plant activities as should have main consideration in high school work, and (2) the preparation for and methods of instruction. *Daily; two periods;* (2½). Mr. Clute.

Prerequisite: Entrance credit in botany or its equivalent.

S 18. Ecology.—The field work required for course 18, given in semesters I and II, may be done wholly or in part dur-

ing the summer session. The student should be able to devote a half day or day to the work, and the credit depends on the number of days per week so occupied. Credit will not be given for the field work alone. *Arrange time;* (1-5); Dr. GLEASON.

Prerequisite: Botany 17 or S 6.

CHEMISTRY

Dr. BALKE, Dr. HOLMES, Mr. DERICK, Mr. EGAN, Mr. NICKELL, Mr. GORDON.

NOTE:—By arangement with the instructor, students, who do not wish to attend the recitations or do the laboratory work, may attend the lectures of S E 1 or S 2, but university credit will not be given in such cases.

GRADUATE WORK.—Graduate students whose major subject is not chemistry or agriculture may take for their graduate work S 5a or S 13a. Students whose major subject is chemistry may take S 111.

SE 1. ELEMENTARY CHEMISTRY.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements. The course consists of illustrated lectures, recitations, and laboratory work. The text employed is Alexander Smith's General Chemistry for Colleges. *Daily, including Saturday; three periods;* (5). Dr. BALKE, Mr. EGAN, Mr. NICKELL, Mr. GORDON.

S 2. DESCRIPTIVE INORGANIC CHEMISTRY.—This course is a continuation of S E 1 and is devoted mainly to the study of the metallic elements, their compounds, and properties. The course consists of illustrated lectures and recitations, but does not include laboratory work. Alexander Smith's General Chemistry for Colleges is used as a guide. *Daily, including Saturday;* (2). Dr. BALKE, Mr. GORDON.

Prerequisite: Chemistry 1.

S 3. QUALITATIVE ANALYSIS.—This course consists of lectures, recitations, and laboratory practice in the ordinary processes of qualitative analysis. *Daily; three periosd;* (3). Dr. BALKE, Mr. EGAN, Mr. NICKELL.

Prerequisite: Chemistry 1.

S 5a. Elementary Quantitative Analysis.—The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods. The lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to the study of solutions. The text book is Lincoln and Walton's Exercses in Quantitative Analysis. *Daily; four periods;* (5). Dr. Holmes.

Prerequisite: Chemistry 1 and 3.

S 9 and 9c. Organic Chemistry.—The work of this course consists in the discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideraton of most of the important classes of derivatives of carbon. The laboratory work of the course will consist of the preparation of typical organic compounds. Remsen's Organic Chemistry. *Three periods;* (5). Mr. Derick.

Prerequisite: Chemistry 2 and 3.

S 11 and S 111. Research.—Opportunity will be given for advanced work and research in inorganic or analytical chemistry. Arrange. (2-5.) Dr. Balke, Dr. Holmes.

S 13a. Agricultural Analysis.—This course is arranged to meet the wants of agricultural students. The work begins with the gravimetric determination and separation of the more important constituents of soils, fertilizers, and agrcultural products; it includes the chemical analysis of food stuffs, such as grains, fodders, and dairy products. The text book is Lincoln and Walton's Elementary Exercises in Quantitative Analysis. *Daily; four periods;* (5). Dr. Holmes.

DRAWING, GENERAL ENGINEERING

Mr. McMaster

S 1. Elements of Drafting.—Required of all engineering students. Consists of lettering, free-hand sketching and working drawings. Lettering. Free-hand treatment through plain forms, emphasis being laid upon off-hand lettering and working drawing titles. Text, Wilson and McMaster's *Notes on Practical Mechanical Drawing.* Sketching. Free-hand sketching of machine parts from models. Time sketches in working drawing from machine

details in the shops and laboratories. Working drawings. Brief exercise in the use of tools, working drawings made from free-hand and time sketches. *Daily; three periods;* (4).

S 2. Descriptive Geometry.—Text, Church's *Descriptive Geometry.* Problems relating to the point, line, and plane; the properties of surfaces, intersections and developments. Recitations and drawing room work daily. *Daily; three periods;* (4).

Prerequisite. General Engineering Drawing 1.

ECONOMICS

Professor Aldrich, of Tulane University, Mr. Brownson

In the Summer Session the only graduate work in economics is research by the individual student. Those who wish graduate credit therefore must enroll in economics S 18.

S 1. Principles of Economics.—A general survey of the field. The forces determining economic development are studied with special reference to the experience of the United States. This course will be accepted as the equivalent of Economics 2. *Four times a week;* (2). Professor Aldrich.

Prerequisite: Two years of University credit.

S 22. Economic History of the United States.—A study of the general industrial development of the country with attention to the growth of some particular industries. *Four times a week;* (2). Mr. Brownson.

Prerequisite: Economics 1 or 2, or (concurrently) S 1.

S 23. The Growth of American Life and Character.—History and Interpretation. A chronological outline of changes in the environment and spirit of American society leads to discussions of the direction and methods of social progress; of important diversities in American life, such as unlikenesses between races, sections, and economic and social classes; of the unity which does or should underlie these diversities; and of the meaning of democracy and of a democratic spirit. High school teachers of history who do not wish credit in this course will be welcome as listeners on presentation of the usual card. *Three periods;* (3). Professor Aldrich.

Prerequisite: A thorough course in U. S. general history, and Economics 1 or Sociology 1, or the equivalent.

S 18. A seminary class or a class in the study of economic literature will be formed according to the wishes of the students. The time of meeting will be determined when the class is organized. The amount of credit will depend on the amount of work done. Professor ALDRICH.

EDUCATION

Professor BAGLEY, Assistant Professor HOLLISTER.

S 1. PRINCIPLES OF EDUCATION: This course will consider (a) the biological principles which condition and limit education, with particular reference to the educational implications of the recent studies in the relative influence of heredity and environment; (b) the psychological principles governing the educative process, especially the laws of attention, habit, memory, and the formation of meanings; (c) the developmental principles which describe and explain the changes of childhood and youth, the chief emphasis being laid upon the changes accompanying puberty and adolescence; (d) the application of these principles to educational practice in connection with the course of study, methods of instruction, and school hygiene. Lectures, discussions, and prescribed readings. *Daily;* (2½). Professor BAGLEY.

S 2. EDUCATIONAL VALUES AND METHODS.—Contemporary methods of instruction and training will be described and analyzed for the purpose of determining in what way and in how far they tend toward a realization of the various values inherent in different types of subject-matter. Language ,history, mathematics, and science will be considered with reference to both elementary and secondary education. (In connection with this course an opportunity will be offered to properly qualified students to observe the class work in the Academy.) Lectures, discussions, and prescribed readings in the recent literature of educational method. *Daily;* (2½). Professor BAGLEY.

S 3. SCHOOL ORGANIZATION AND ADMINISTRATION.—A general course in administration taking for its foundation the historical background of the American public school system. The problems of organization and administration will be considered in their national, state, county, township and district aspects, with

comparative studies. Special emphasis will be placed on financial support, supervision, teachers' qualifications, and community adjustments. This course may count for graduate credit. *Lectures, discussions and required readings. Daily;* (2½). Assistant Professor HOLLISTER.

S 4. HIGH SCHOOL ADMINISTRATION. The organization and development of the American high school will be discussed and compared with European secondary schools. The treatment will center in the program of studies, the psychological principles involved in its organization, and the various means of making it effective. Consideration will also be given to the more important problems growing out of the school as a social group. *Recitation, lectures and discussions, with the written development of a selected problem. Daily;* (2½). Assistant Professor HOLLISTER.

ENGLISH

Professor DODGE, Assistant Professor BALDWIN, Acting Principal MCCONN, Mr. SCOTT, Mr. GUILD, Mr. HALLIDAY, Mr. TIETJE, Miss HARBARGER.

S 1a. INTRODUCTORY COURSE—English literature before the Nineteenth Century. This course with S 1b is equivalent to English 1 as outlined in the regular catalog. *Four periods a week;* (2). Assistant Professor BALDWIN.

S 1b. INTRODUCTORY COURSE. English Literature before the Nineteenth Century.—This course with S 1a is equivalent to English 1 as outlined in the regular catalog. *Four periods a week;* (2). Assistant Professor BALDWIN, Miss HARBARGER.

S 2a. INTRODUCTORY COURSE. English Literature of the Nineteenth Century. This course with S 2b is equivalent to English 2 as outlined in the regular catalog. *Four periods a week;* (2). Mr. TIETJE.

S 2b. INTRODUCTORY COURSE. English Literature of the Nineteenth Century.—This course with English S 2a is equivalent to English 2 as outlined in the regular catalog. *Four periods a week;* (2). Mr. TIETJE.

S 4. ENGLISH VERSIFICATION.—Theory of English meter and rhythm; history of the development of the forms of English

verse. By special arrangement with the instructor properly qualified students may count this course for graduate credit, but they must indicate their intention at the time of registration. *Four periods a week;* (2). Mr. SCOTT.

S 11. CONTEMPORARY WRITER.—Some of the literary movements of the present are traced in the works of living novelists, essayists, and dramatists. *Four periods a week; first six weeks;* (1½). Professor DODGE.

S 15. TEACHERS' COURSE. Methods of Teaching English Literature and Composition in the High School. *Three periods a week;* (1½). Mr. TIETJE.

S 17.. HISTORICAL ENGLISH GRAMMAR. Problems of modern grammar will be studied in their relation to the earlier periods of the language. *Four periods a week; first six weeks;* (1½). Professor DODGE.

S 19. LITERARY STUDY OF THE BIBLE.—The Psalms and the Prophets, lyric poetry and oratory. *Daily; first six weeks;* 1 2-3). Assistant Professor BALDWIN.

S 23. ELEMENTARY COURSE IN SHAKESPERE.—*Four periods a week;* (2). Mr. GUILD.

S 33. ENGLISH POETRY OF THE NINETEENTH CENTURY.—*Four periods a week;* (2). Mr. GUILD.

RHETORIC

S 1a. RHETORIC AND THEMES.—This course is the same as the first semester of Rhetoric 1 as outlined in the regular catalog. *Daily;* (3). *Two sections.* Miss HARBARGER, Mr. MCCONN.

S 1b. RHETORIC AND THEMES.—This course is the same as the second semester of Rhetoric 1 as outlined in the regular catalog. *Daily;* (3). Mr. SCOTT.

S 3. DAILY THEMES.—Five short themes a week with a four-page theme every fortnight. (2). Mr SCOTT.

By special arrangement with the instructor students may be allowed to make four hours in this course, but they must indicate their intention at the time of registration.

S 5. EXTEMPORE SPEAKING.—Platform discussion of current events, practice in after dinner speaking, impromptu debates, etc. *Two periods a week;* (1). Mr. HALLIDAY.

S 7. Public Speaking.—An introductory course in public speaking; vocal, breathing, action, and declamation exercises, supplemented by text-book and individual instruction. *Four periods a week;* (2). Mr. Halliday.

S 13. Debating.—*Two periods a week;* (1). Mr. Halliday.

ENTOMOLOGY

Dr. Folsom, Mr. Tanquary

S 1. General Field and Laboratory Course.—A beginning course, including field, laboratory, and insectary observations on the most important economic insects available at the time, and on other forms particularly interesting to the teacher. A well-equipped insectary is available, and frequent field excursions are made under the leadership of the instructor. *Daily;* (2½). Dr. Folsom.

S 2. Advanced Course.—This course, consisting chiefly of field and insectary work on economic and ecological subjects, is open to those who have had courses S 1 or its equivalent. This course is open for graduate credit. *Daily;* (2½). Dr. Folsom.

FRENCH

Professor Oliver, Mr. Owen

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easier texts. *Daily;* (2½). Mr. Owen.

S 2. Reading of Modern French.—A course in rapid reading of modern authors for students who have had the equivalent of a year's elementary French in a college. Composition, conversation. *Daily; first six weeks;* (2). Professor Oliver.

S 3. Supplementary Work.—Under the direction of the instructor, competent students may supplement the work of either of the preceding courses so as to make S 1 the equivalent of the first semester of the regular University course 1, or course S 2 the equivalent of the first semester of the regular University course 2. Professor Oliver, Mr. Owen.

S 4. French Comedy.—The development of French comedy with especial emphasis upon Molière. Lectures, interpretative and collateral readings. *Three periods a week; first six weeks;* (1). More by arrangement. Students wishing to make this

arrangement must indicate it at the time of registration. Professor OLIVER.

S 5. ADVANCED PROSE COMPOSITION AND CONVERSATION.—An advanced course aiming to give some facility in writing and speaking idiomatic French. Designed chiefly for students intending to teach French. *Two periods a week, first six weeks;* (1 or more by arrangement). Professor OLIVER.

S 120. SEMINAR.—An opportunity is here offered for graduate work. Professor OLIVER.

GERMAN

Assistant Professor MEYER, Dr. CHILES, Dr. WIEHR

S 1. BEGINNERS' COURSE.—Pronunciation, grammar, composition, reading easy texts. *Daily including Saturday;* (3). *Two sections.* Assistant Professor MEYER, Dr. CHILES.

S 2. INTERMEDIATE COURSE.—Grammar, composition, reading. Open to those who have had German 1 of the regular University year, or an equivalent. *Five times a week;* (2½). Dr. WIEHR.

S 3. PROSE READING.—Reading of narrative prose, sight translation, composition. Open to those who have had regular course 3 in the University, or an equivalent. *Five times a week;* (2½). Dr. CHILES.

S 4. READINGS FROM THE CLASSICS.—Lessing's Minna von Barnhelm, Goethe's Hermann und Dorothea, Composition. Open to those who have had regular course 4 in the University, or an equivalent. *Five times a week;* (2½). Dr. WIEHR.

Students securing a grade of 85 or more and doing additional work assigned by the instructor, may supplement the work of S 1, S 2, S 3, or S 4, making it the equivalent of the University courses 1, 3, 4, or 5 respectively, the amount to be indicated at registration.

S 5. PROSE COMPOSITION.—Translation of ordinary prose into German, study of idiomatic constructions, and practice in rendering at sight. Open to those who have had two years of University work, or an equivalent. *Two hours a week;* (1). Dr. CHILES.

S 7. READINGS FROM PROSE FICTION.—Rapid translation and sight reading of such works as Hauff's Lichtenstein, Ludwig's Zwischen Himmel und Erde. Open to those who have had two

years of University work, or an equivalent. *Five times a week;* (2½). *More by arrangement, to be indicated at registration.* Assistant Professor MEYER.

S 8. GOTHIC OR MIDDLE HIGH GERMAN.—A course will be given in Gothic or in Middle High German, to be determined by the preferences of those who make application. Open to those who have had four years of University work, and to others by special arrangement. This course may be counted toward graduate credit. *Three times a week;* (1½). Dr. WIEHR.

HISTORY

Professor FORD, Professor CONGER, Assistant Professor LARSON.

S 1. MEDIEVAL EUROPE.—An introductory survey of European history from the fourth century to the close of the fifteenth. The course deals chiefly with continental affairs, events in England being studied only in connection with the general European movements. Lectures, recitations, and collateral reading. *Daily, including Saturday;* (3). Assistant Professor LARSON.

S 3. AMERICAN HISTORY, 1789-1861.—The emphasis will rest upon the political and constitutional phases of the subject. Lectures, quizzes, and reports. *Daily, including Saturday; first six weeks;* (2). Professor CONGER.

(Courses S 12 and S 22 are open only to graduates and to undergraduates who have the substantial equivalent of junior standing in the University.)

S 12. ENGLAND IN THE EIGHTEENTH CENTURY.—An advanced course in English history from the accession of William and Mary (1689) to the close of the Napoleonic wars (1815). Particular attention will be given to the colonial and imperial phases of the period, such as the international situation, the American problems, the conquest of India, and the relations of England with Ireland, Scotland, and the British possessions. *Four times a week;* (2½). Assistant Professor LARSON.

Prerequisite: At least one college course in English or American history.

S 22. THE GENESIS OF NULLIFICATION IN SOUTH CAROLINA.—The principal expressions of states rights feeling from the formation of the Federal Constitution until 1830 will be studied in

order to trace the growth of the doctrine. Exercises in the critical use of documentary material. *Four times a week;* (2). Professor CONGER.

Prerequisite: At least one college course in American History.

For Graduates

S 121. SELECTED TOPICS IN THE HISTORY OF EUROPE DURING THE REVOLUTIONARY EPOCH AND THE NINETEENTH CENTURY.—This course does not aim at a connected presentation of the whole period. Certain events, persons, and movements are selected for intensive study. *Daily; first six weeks; arrange hours;* (2). Professor FORD.

HOUSEHOLD SCIENCE

Miss PINCOMB

S 1. FOOD.—The work in this course will consist of lectures, laboratory work and quiz. Demonstrations will be given in connection with the laboratory work. *Daily; first six weeks;* (1½).

S 2. THE HOUSE.—In this course the plan, decoration and care of the house will be considered. *Three periods a week; first six weeks;* (1).

S 3. ORGANIZATION AND EQUIPMENT.—This course will include work in both domestic science and domestic art. They will be considered from the standpoint of their relation to other subjects in the school curriculum; kind and cost of equipment and methods of presentation will be considered. *Two periods a week; first six weeks;* (1).

NOTE:—In view of the desire expressed by the teachers who participated in the conference on Domestic Science in the public schools the work in the Summer Session is planned with special reference to the needs of such teachers. The problems of the rural school teacher will also be considerd.

LATIN

Professor BARTON

S 1. LATIN WRITING.—Continuous prose based on Roman History. *Three periods a week;* (1½). Professor BARTON.

S 2. MARTIAL.—Selections with especial reference to social conditions. *Two periods a week;* (1). Professor BARTON.

S 3. TACITUS.—Selections from the histories. Events of the year 69. This course may count for graduate credit. *Three periods a week;* (1½). Professor BARTON.

S 4. Private Life with some conisderation of the Monuments *Two periods a week;* (1). Professor BARTON.

LAW

Professor HUGHES, Professor GREEN, Professor BIRDZELL, Associate Professor NORTHRUP, Mr. COSGROVE.

The work in the College of Law will extend through a period of ten weeks, from June 21 to August 25. The session will be divided into two parts of five weeks each, viz., from June 21 to July 24, inclusive, and from July 26 to August 25, inclusive. For detailed information concerning these courses address Professor BARRY GILBERT, Secretary of the College of Law, Urbana, Illinois.

FIRST HALF

S 3. REAL PROPERTY.—*Gray's Cases on Property, Vols.* 1 *and* 2. *Six periods a week;* (2). Professor NORTHRUP.

S 7. DOMESTIC RELATIONS.—*Smith's Cases on the Law of Persons. Six periods a week;* (2). Professor GREEN .

S 13. DAMAGES.—*Beale's Cases. Six periods a week;* (2). Mr. COSGROVE.

S 18. WILLS.—*Gray's Cases, Vol. IV. Six periods a week;* (2). Professor NORTHRUP.

S 23. MORTGAGES.—*Kirchevey's Cases. Six periods a week;* (2). Mr. COSGROVE.

S 28. INSURANCE.—*Wambaugh's Cases. Six periods a week;* (2). Professor GREEN.

SECOND HALF.

S 1. CONTRACTS.—*Williston's Cases. Twelve periods a week;* (4). Professor BIRDZELL.

S 8. EVIDENCE.—*Thayer's Cases. Twelve periods a week;* (4). Professor HUGHES.

MATHEMATICS

Assistant Professor YOUNG, Dr. BORGER, Dr. LYTLE, Dr. WAHLIN, Mr. DENTON.

S 2. ADVANCED ALGEBRA.—This course will be equivalent to that offered in the University on the same subject. The work will cover the following topics:

Progressions, binominal theorem, undetermined coefficients, partial fractions, permutations and combinations, imaginaries, logarithms, and the elements of the theory of equations. *Daily;* (3). Mr. DENTON.

S 4. PLANE TRIGONOMETRY.—This course will be equivalent to that offered in the University on the same subject. *Daily;* (2). Dr. LYTLE.

S 5. TEACHERS' COURSE.—In this course special attention is given to a discussion of the methods of teaching algebra and geometry, the position of mathematics in the secondary school course, the correlation of mathematics with allied subjects, a comparative study of the leading text books, and a brief history of elementary mathematics. *Daily;* (3). Dr. LYTLE.

S 6. ANALYTICAL GEOMETRY.—The problems of geometry can be formulated and treated analytically, those of analysis can be treated geometrically. In this course algebra and geometry are united. The main topics to be discussed will be the equations of the first and second degree, and their geometric interpretation. Other loci will also be treated. There will also be a brief account of the analytical geometry of three dimensions. *Daily;* (2½ to 5). Mr. DENTON.

S 7. DIFFERENTIAL CALCULUS.—This course is equivalent to that offered in the University as Mathematics 7. *Daily;* (2½ to 5). Dr. WAHLIN.

S 9. INTEGRAL CALCULUS.—This course is equivalent to that offered in the University as Mathematics 9. *Daily;* (3). Dr. BORGER and Dr. WAHLIN.

S 18. HIGHER PLANE CURVES.—This course includes the general theory of algebraic curves, together with the application of the theory of invariants to higher plane curves. Special study is made of curves of the third and fourth order. This course may be counted for graduate credit. *Daily;* (3). Dr. BORGER.

S 28. THEORY OF NUMBERS.—The course will include a discussion of congruences, quadratic residues, linear and quadratic forms and a detailed study of the quadratic number-field. This course may be counted for graduate credit. *Daily;* (3). Assistant Professor YOUNG.

S 15. SEMINARY AND THESIS. (3). Assistant Professor YOUNG.

S 40. LECTURES ON THE FOUNDATIONS OF MATHEMATICS.—A course of ten lectures dealing with the fundamental concepts of elementary mathematics. Especially recommended to teachers of mathematics in colleges and secondary schools. *Twice a week for five weeks;* (½ to 1). Assistant Professor YOUNG.

MECHANICS, THEORETICAL AND APPLIED.

Mr. ENGSTROM, Mr. ENGER, Mr. FLEMING.

S 7. ANALYTICAL MECHANICS.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics. Daily;* (3). Mr. ENGSTROM.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 8. ANALYTICAL MECHANICS.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics. Daily;* (2½). Mr. ENGSTROM.

Prerequisite: Mathematics 9 and T. & A. M. 7.

S 9. RESISTANCE OF MATERIALS.—Training in the elementary principles of the mechanics of materials, with experiments and investigations in the materials laboratory to verify the experimental laws; problems in ordinary engineering practice to train the student in the use of his knowledge. This course covers the same ground both in text book, problem work and in experiments in the materials testing laboratory as T. and A. M. 9. Merriman's Mechanics of Materials. *Daily in class room and two double periods in laboratory;* (3½). Mr. FLEMING.

Prerequisite: T. and A. M. 7 and registration in T. and A. M. 8.

S 10. HYDRAULICS.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observa-

tion and measurement of pressure, velocity, and flow, in power and efficiency, and in the determination of experimental coefficients. *Hoskin's Hydraulics. Four times a week and two double periods in laboratory;* (3). Mr. ENGER.

With the opening of the hydraulic laboratory for the Summer School, arrangements may be made to use its facilities for special experimental work.

MECHANICAL ENGINEERING

Assistant Professor GILL, Mr. SCROGGIN, Mr. GOBEN, Mr. LANHAM, Mr. ELLIS, Mr. CASPER

These courses will be the equivalent of those offered in the same subjects during the University year.

S 1a. PATTERN SHOP.—This course includes the care and use of tools, and the construction of patterns, core boxes, match boards, etc. The shop is equipped with tools, benches and machines such as are found in modern pattern shops. *Five three hour periods a week;* (3). Mr. ELLIS.

S 1b. FORGE SHOP.—This course will include work in shaping and welding iron and steel; dressing and tempering lathe and other tools; annealing and case herdening. *One two-hour, and two three-hour periods a week;* (1½). Mr. LANHAM.

S 1c. FOUNDRY.—Care and management of the cupola; floor, bench and machine molding; green and dry sand cores; mixing and casting brass, aluminum, and other soft metals. *Two three-hour and one two-hour period a week;* (1½). Mr. CASPER.

S 2a. MACHINE SHOP.—Exercises in chipping and filing; elementary work on lathe, drill press, shaper, planer, and grinding machine. *Five three-hour periods a week;* (2½). Mr. SCROGGIN, Mr. GOBEN.

S 2b. ADVANCED MACHINE SHOP.—This course includes the use of milling machine, screw machine, gear cutter, boring mill and turret lathe; erecting and testing of machines and gas engines. *Five three-hour periods a week;* (2½). Mr. SCROGGIN.

Lectures on tools and shop processes are given frequently, and inspection trips to shops in the local and adjoining towns are made in connection with all classes in shop practice. A

student may finish one full year's work in the shop during the summer term.

PHYSICAL TRAINING

Mr. Hana, Mr. Hachmeister, Miss Atkinson, Miss Pease, Miss Crow

FOR WOMEN

S 1. Practice.—The aim of this course is to enable students to overcome, by means of corrective and educational gymnastics, faulty posture and growth, and to develop a healthy body. Elementary gymnastics, marching, Swedish free exercises, dumb-bells, clubs, wands, fancy steps, folk dances, simple exercises on various pieces of apparatus, tennis, basket ball, hockey, golf, lawn bowling, games and out-of-door play. *Daily; first six weeks.* Miss Atkinson, Miss Pease.

S 2. Practice.—This course offers opportunities for teachers who desire special instruction in certain lines, suitable for public school work. Drills in light and free gymnastics, Indian clubs, dumb-bells, wands, gymnastic dancing, Maypole figures, artistic gymnastics, out-of-door athletics, folk dances and games. Classes will be formed in special subjects as desired. *Daily; first six weeks.* Miss Atkinson, Miss Pease.

S 3. Swimming.—The swimming pool of the Woman's gymnasium will be open daily, affording opportunity for instruction and practice during nine weeks. Miss Atkinson, Miss Crow.

FOR MEN

S 1. Gymnasium Practice.—Setting up exercises, practical elementary class drills with dumb-bells, wands, clubs, and chest weights, and elementary heavy apparatus work. *Three periods a week.* Mr. Hana.

S 2. Gymnasium Practice.—Intermediate and advanced heavy apparatus work. *Three periods a week.* Mr. Hana.

S 3. Lecture.—Personal hygiene. Lectures upon bodily health, including such subjects as the bath, sleep, diet, injuries from over work and study, sedentation, tobacco, alcohol, sexology. *Once a week.* Mr. Hana.

S 4. Swimming.—The large pool in the Gymnasium offers ample facilities for swimming. *Daily.* Mr. Hachmeister.

PHYSICS

Assistant Professor Watson, Mr. Williams, Mr. Stifler, Mr. Stephenson, Mr. ———

(*All courses in Physics will continue for only the first six weeks*).

S 2a. General Physics.—Lectures with experimental illustrations and recitations. The topics treated in 1909 will be wave motion, sound and light. *Daily;* (1). Mr. Stifler.

Prerequisite: Plane geometry and high school algebra.

S 2b. General Physics Laboratory.—A laboratory course in sound and light to accompany S 2a. *Three two-hour periods a week;* (1). Mr. Stephenson, Mr. ———

Prerequisite: Plane geometry and high school algebra.

S 4. Electrical and Magnetic Measurements.—Laboratory exercises with discussions and recitations. It is taken during the fall and winter semesters by junior students in electrical engineering and is recommended to others wishing an exact course in electrical and magnetic measurements. *Three three-hour periods a week;* (1). Mr. Williams.

S 4a. Introduction to Theoretical Electricity.—A course of lectures and recitations discussing the phenomena of static electricity with elementary calculus methods and with occasional lecture room demonstrations. The text-book will be Foster and Porter's Electricity and Magnetism. *Daily;* (2). Mr. Williams.

Prerequisite: Consult instructor.

S 15. Electricity and Magnetism.—(Students desiring to take this course should consult with the instructor). Mr. Williams.

S 16a. Heat.—Lectures and recitations on fundamental heat phenomena and elements of the mechanical theory of heat. Laboratory experiments in thermometry, calorimetry, vapor pressures, expansion, and conduction and radiation of heat, mechanical equivalent of heat, etc. *Three three-hour periods a week;* (1). Assistant Professor Watson.

Prerequisite: A course in general physics.

S 18. Teachers' Course.—Discussion of practical problems that confront the teacher in high school physics. A laboratory course in physics suitable for the high school will be outlined and some of the experiments performed. *Two two-hour periods each week;* (2-3). Mr. Stifler.

S 13. Investigation of Special Problems.—An advanced course in the laboratory or in design and calculation. A problem is chosen and worked out with the advice and direction of the instructor. This course may be counted for graduate credit. (1 or 2). Assistant Professor Watson.

S 33. Seminary and Thesis.—This course is primarily for graduate students. (1 or 2). Assistant Professor Watson.

POLITICAL SCIENCE

Professor Scott

S 1. Government and Politics in the United States.—A general study of the American system of government in its local, state and federal organs, and their relation to each other, as well as of the methods of political action. *Daily; first six weeks;* (1 2-3).

S 2. Party Government.—A study of the theory and development of the party system; the organization and methods of action of political parties in the United States; the legal control of parties; and reform tendencies. This course may be taken for graduate credit under conditions prescribed by the instructor. *Daily; first six weeks;* (1 2-3).

PSYCHOLOGY

Professor Colvin, Miss Abbott

S 1. Elementary Psychology.—A beginners' course which aims to serve as a basis for further study in psychology, education, and philosophy. *Daily; first six weeks;* (2). Professor Colvin.

S 2. Introduction to Experimental Psychology.—Experiments in sensation, perception, memory and imagination. *Two lectures a week and three two-hour laboratory periods; first six weeks;* (2). Professor Colvin, Miss Abbott.

(May be taken in connection with S 1. Regular University students may count these combined courses as equivalent to Psychology 1).

S 3. The Psychology of the Learning Process.—A critical discussion of the problems of acquisition, memory, and imagination. *Three lectures a week and two two-hour laboratory periods; first six weeks;* (2). Professor Colvin, Miss Abbott.

SOCIOLOGY

Professor Hayes, Professor Aldrich

S 1. Principles of Sociology.—For students with preparation equal to that required for junior standing. The course may be taken for graduate credit with such additional work as the instructor assigns. *Daily; first six weeks;* (1 2-3).

S 5. Charities and Corrections.—The treatment, causes, and prevention of poverty and crime. *Daily; first six weeks;* (1 2-3).

S 6. Same as Economics S 23.

SPANISH

Mr. Owen

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easy texts. *Daily;* (2½). Mr. Owen.

S 3. Supplementary Work.—An opportunity is offered to do supplementary work in Spanish similar to that described above for French. Mr. Owen.

ZOOLOGY

Dr. Peters, Mr. Gross

S 1 or S E 1. Elementary Zoology.—In this course, types of vertebrate and of invertebrate animals are studied from the ecological, morphological, and physiological points of view. The laboratory work is done on a series of types so selected as to include those which are most useful in high school courses. This course is intended to serve the purposes of the high school teacher, and also as an introduction to any University work in this department. Students who desire University credit for Zoology 10 must arrange with the instructor to do the required work. *Daily; two periods;* (2½). Dr. Peters, Mr. Gross.

S 2. Teachers' Course.—This is a course intended to meet the practical needs and remedy some of the common deficiencies of those who may have an elementary knowledge of the subject but who are not trained in the method of its presentation to classes. The following topics are treated as fully as time permits:

1. The general principles of zoological instruction. Text and reference books and their function. The selection and sequence of animals for laboratory study. Laboratory guides and students' note-books. The school collection. The correlation of zoology and human physiology.

2. The collection, preparation, and preservation of material for class work, and the properties of a few selected preservatives. Practice in making and demonstrating dissections for class use, including injected specimens. Selected methods in technique of particular value to teachers.

3. The field work which will naturally be taken with this course is described under S 3.

4. Some physiological and experimental study of type animals similar to that of the class in S 1. *Three meetings a week; first six weeks; two periods;* (1).

Prerequisite: S 1 or its equivalent.

S 3. Field Zoology and Orinthology.—A course in which the major part of the attention is given to the observation and identification of birds and other animals of the vicinity, which are of most interest to teachers. (For field work on insects, see the description of courses in Entomology). *Two meetings a week; two periods;* (1). Mr. Gross.

S 5. Physiological Zoology.—The physiological processes and their development are studied in this course in a comparative way as exhibited in the series of zoological groups from the *Protozoa* to man. The work is arranged with special reference to teachers of both zoology and human physiology. Lectures and laboratory work. *Two periods a week of two hours each; first six weeks;* (1). Dr. Peters.

Prerequisite: S 1 or its equivalent.

ACADEMY

The following subjects will be offered in the Academy. Students registered in one or more of these courses will be charged an additional fee of $5.00 whether they hold scholarships or not.

ENGLISH

Mr. McConn

S A 1. Grammar and Punctuation.—A thorough review of the sentence, with emphasis on the practical applications of grammar in correct and effective speech and writing. Punctuation is taught incidentally as the means of indicating grammatical relations. Discussion of methods of teaching grammar in the high school. *Daily.* Mr. McConn.

S A 1a. Spelling.—How to learn to spell and how to teach spelling. *Saturdays.* Mr. McConn.

Note.—English S A 1 and S A 1a are intended primarily for those expecting to teach the subjects and those whose early training in them has lacked thoroughness. Either course may be taken by itself. The two courses (six days a week) together with Rhetoric S 1 (Rhetoric and Themes) will be accepted for the unit in English Composition required for entrance.

LATIN

Mr. Thomas

S A 1. Elementary Latin.—A review of Latin grammar, intended for persons wishing to resume the study of Latin after an interval and for those expecting to teach the subject. Incidental discussion of methods of teaching. *Daily;* (1 *unit*). Mr. Thomas.

Prerequisite: One half year's work or the equivalent.

S A 2. Caesar.—*De Bello Gallico,* Books 1-4. Incidental discussion of methods of teaching Caesar in the high school. *Twice daily;* (1 *unit*). Mr. Thomas.

Prerequisite: One year's work or the equivalent.

MATHEMATICS

Mr. THOMPSON

S A 1 REVIEW ALGEBRA.—A rapid review through simple simultaneous equations; fuller treatment of radicals, imaginary quantities, the theory of exponents, and quadratic equations. Incidental discussion of methods of teaching. *Daily;* (1½ *units*). Mr. THOMPSON.

Prerequisite: One year's work or the equivalent.

S A 2. REVIEW PLANE GEOMETRY.—A review of selected theorems in Books 1 and 2; fuller treatment of Books 3-5. Incidental discussion of methods of teaching. *Daily;* (1 *unit*). Mr. THOMPSON.

Prerequisite: One half year's work or the equivalent.

S A 3. SOLID GEOMETRY.—*Daily;* (½ *unit*). Mr. THOMPSON.

Prerequisite: Plane Geometry.

UNIVERSITY OF ILLINOIS

LOCATION

The University of Illinois is situated in Champaign County in the eastern central part of the State between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis Railroads. The cities of Urbana and Champaign have together a population of 20,000.

The institution was incorporated February 28, 1867, under the name, The Illinois Industrial University. It was not until 1885 that the Legislature changed the name to The University of Illinois.

BUILDINGS AND GROUNDS

The land occupied by the University and its several departments embraces about two hundred and twenty acres, besides a farm of four hundred acres. The buildings at Urbana are twenty-three in number, and consist of the Agricultural Building, the Agronomy Building, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Electrical Engineering Laboratory, Engineering Hall, the Farm Mechanics Building, the Horticulturist Building, the Law Building, the Library, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, The Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop and Foundry. A Physics Building and a large addition to the Natural Histroy Building are in process of construction.

LIBRARIES

The general University library, the library of the State Laboratory of Natural History, that of the Agricultural Experiment Station, and that of the College of Law are all at the University in Urbana.

The general University library, including the Agricultural Experiment Station library, contains 115,000 volumes and pamphlets. The reading room contains over 3,100 bound volumes of periodicals. The University has a subscription list of 1,112 periodicals, the current numbers of which are kept in the east tower reading room. The library of the State Laboratory of Natural History contains 6,060 volumes and 16,440 pamphlets. The Library of the College of Law contains the Federal and State Reports, the leading text-books, and a line of leading periodicals. The department of education has made a special collection of about 1,500 books and 3,000 pamphlets, which are kept in the rooms of the department in University Hall. This collection contains a very good assortment of modern text books, and copies of the course of study of nearly all the large city school systems.

ATHLETICS

Although both the men's and women's Gymnasiums will be used in some part for the regular class work in Physical Training, they are nevertheless open to students not registered in those courses for the purposes of general recreation and exercise. Both the Gymnasiums are new and are among the most effective structures of their kind in the country. Each contains swimming pool, shower, and other forms of bath, lockers and dressing rooms. Students are charged a small sum for a locker. The tennis courts upon the University campus are open to the student body. The genral athletic fields will be open to the students. During past sessions baseball teams have been organized

and an interest in that sport developed. The golf links which are in the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, baseball clubs, etc.

BOARDING AND LODGING

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Woman's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

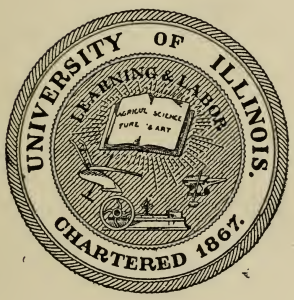
Board can be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or,

THOMAS ARKLE CLARK, Director,
Urbana, Illinois.

THE UNIVERSITY OF ILLINOIS
SUMMER SESSION
1910



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UNIVERSITY OF ILLINOIS

CALENDAR

Summer Session

June 20, 1910, Monday	Registration Day.
July 29, Friday	Examination for six-weeks' courses; and for all who cannot stay the full session.
Aug. 18 and 19, Thursday and Friday	Final Examinations.

First Semester

Sept. 10-17, Wednesday	Entrance Examinations.
Sept. 19-20, Monday and Tuesday	Registration Days.
Sept. 21, Wednesday	Instruction begins.

REGISTRATION OF STUDENTS

'94-'95	810
'95-'96	855
'96-'97	1075
'97-'98	1585
'98-'99	1825
'99-'00	2234
'00-'01	2505
'01-'02	2950
'02-'03	3288
'03-'04	3594
'04-'05	3729
'05-'06	4074
'06-'07	4316
'07-'08	4743
'08-'09	4977

OFFICERS OF THE SUMMER SESSION

EDMUND JANES JAMES, Ph. D., LL. D., President of the University.

Committee on Summer Session

DAVID KINLEY, Ph.D., LL.D., Dean of the Graduate School.

EDGAR JEROME TOWNSEND, Ph.D., Dean of the College of Science.

EVARTS BOUTELLE GREENE, Ph.D., Dean of the College of Literature and Arts.

THOMAS ARKLE CLARK, B.L., Dean of Men.

WILLIAM CHANDLER BAGLEY, Ph.D., Director of the School of Education; *Chairman,* and Director of the Summer Session.

SAMUEL WALKER SHATTUCK, C.E., Comptroller. Office, Natural History Building.

WILLIAM LOWE PILLSBURY, A.M., Registrar. Office, Natural History Building.

CORPS OF INSTRUCTION FOR THE SUMMER SESSION, UNIVERSITY OF ILLINOIS, 1910.

Anderson, Lewis Flint, Ph.D., Assistant Professor of Education.

Bagley, William Chandler, Ph.D., Professor of Education.

Balke, Clarence William, Ph.D., Associate in Chemistry.

Barto, Daniel Otis, B.S., Instructor in Secondary School Agriculture.

Broaddus, Elizabeth Minerva, Assistant in Physical Training.

Brooks, Verna, A.B., Assistant in Physical Training.

Canter, Howard Vernon, Ph.D., Associate in the Classics.

Carnahan, David Hobart, Ph.D., Associate Professor of Romance Languages.

Caspar, Quitmar Shields, Instructor in Mechanical Engineering.

Charles, Fred Lemar, M.S., Assistant Professor of Agricultural Education.

Chiles, James Alvin, Ph.D., Instructor in German.

Clark, Thomas Arkle, B.L., Dean of Men. Professor of Rhetoric.

Collins, Vida Lucile, A.B., Assistant in English.

Colvin, Stephen Sheldon, Ph.D., Professor of Psychology.

Conger, John Leonard, Ph.D., Professor of History, Knox College.

Crawshaw, Fred Duane, M.E., Assistant Dean, College of Engineering; Director of Summer Courses in Manual Training.

Crigler, Nina Belle, B.S., Assistant in Household Science.

Denton, William Wells, A.M., Assistant in Mathematics.

Derick, Clarence George, M.S., Assistant in Chemistry.

Dodge, Daniel Kilham, Ph.D., Professor of English.

Egan, James Everett, A.B., Assistant in Chemistry.

Ellis, Frederick, Instructor in Wood Shop.

Emmons, Clyde Wilbur, A.M., Assistant in Mathematics.

Enger, Melvin Lorenius, B.S., Associate in Theoretical and Applied Mechanics, and Municipal and Sanitary Engineering.

Engstrom, Roy Victor, B.S., Assistant Professor of Theoretical and Applied Mechanics.

Fleming, Virgil, R., B.S., Instructor in Theoretical and Applied Mechanics.

Folsom, Justus Watson, Sc.D., Assistant Professor of Entomology.

Ford, Guy Stanton, Ph.D., Professor of Modern European History.

Gill, James Herbert, M.E., Assistant Professor of Machine Construction; in charge of Mechanical Department Shops.

Gordon, W. O., Instructor in Chemistry.

Goben, Loma William, Instructor in Metal Shops.

Halliday, Ernest Milton, A.B., LL.B., Associate in English.

Henion, Lora Atkins, A.B., Assistant in English.

Hollister, Horace Adelbert, A.M., Assistant Professor and High School Visitor.

Holmes, Willis B., Ph.D., Associate in Chemistry.

Hottes, Charles Frederick, Ph.D., Assistant Professor of Botany.

Hutton, Joseph Gladden, B.S., Assistant in Geology.

Isham, Helen, Ph.D., Instructor in Chemistry.

Jaeck, Emma G., A.M., Assistant in German.

Jones, Florence Nightingale, Ph.D., Instructor in Romance Languages.

Kunz, Jakob, Ph.D., Assistant Professor of Physics.

Lake, Edward John, B.S., Assistant Professor of Art and Design.

Lanham, Edgar T., Instructor in Forge Shop.

Larson, Laurence Marcellus, Ph.D., Assistant Professor of History.

La Rue, George Royer, B.S., A.M., Research Assistant in Zoölogy.

Lytle, Ernest Barnes, Ph.D., Instructor in Mathematics.

Mc Conn, Charles Maxwell, A.M., Principal of the Academy.

Miller, John Abram, Ph.D. ,Professor of Mathematics.

Morton, Davis Walter, A.M., B.D., Instructor in Economics.

Nickell, Lloyd Francis, A.B., Assistant in Chemistry.

Norris, George, Assistant in Physical Training for Men.

Poor, Charles Marshall, Ph.D., Instructor in German.

Porter, Francis Marion, B.S., Instructor in General Engineering Drawing.

Pricer, John Lossen, A.M., Assistant in Botany.

Schulz, William Frederick, E.E., Ph.D., Assistant Professor of Physics.

Smith, Frank, A.M., Curator of Museum and Associate Professor of Zoölogy.

Tanquary, Maurice Cole, A.M., Assistant in Entomology.

Tietje, Arthur Jerrold, A.M., Assistant in English.

Wahlin, Gustaf Eric, Ph.D., Instructor in Mathematics.

Ward, Henry Baldwin, Ph.D., Professor of Zoölogy; Vice-Director of Biological Station.

Weston, Nathan Austin, Ph.D., Assistant Professor of Economics.

Warnock, Arthur Ray, A.B., Instructor in English.

Wiehr, Josef, Ph.D., Instructor in German.

Williams, Mary Edith, A.M., Instructor in Physical Training for Women.

General Statement

The Summer Session of the University of Illinois for the year 1910 will open June 20 and close August 19 making a term of nine weeks. This is equivalent to one-fourth of the regular University year, and credit will be given on that basis. The opening day will be devoted to registration. Examinations for those desiring credit for the work will be held on Thursday and Friday, August 18 and 19. Examination in some of the courses may be taken at the end of six weeks by those who find it impossible to remain during the whole session. Instruction begins on June 21 and closes on August 17.

The exact amount of credit given for each course is stated in connection with the outline of courses given later in this announcement. Students will be allowed to carry only nine credit hours of work.

Purpose

The primary purpose of the Summer Session is to meet the needs of teachers in the elementary, secondary, and higher schools who wish to spend part of the summer vacation in serious study or investigation. The greater number of courses offered appeal particularly to high school teachers, to supervising officers, to

teachers of special subjects (art, manual training, domestic science, agriculture, etc.), and to college instructors, school superintendents, and principals who are working for advanced degrees. At the same time, students who may not fall within these groups are welcomed at the session, and a number of courses of a more general nature are provided to meet their needs.

Attention is called to the fact that the nine-weeks' courses offer work equivalent to the half-semester of the regular University course. Consequently the work of four summers will equal the work of one academic year.

Fees

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee in some courses is charged for material used. Any single course may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken. A single course is understood to mean not more than two and one-half credit hours.

Scholarships

In accordance with an action of the Board of Trustees of the University, all high school teachers in Illinois, and all other teachers in the State who are able to matriculate in the University, are entitled to a free scholarship in the Summer Session of the University. To matriculate in the University, one must either pass the entrance examinations, or present a diploma from an accredited high school or other evidence of having completed the requisite amount of preparatory work. Teachers desiring these scholarships should present to the Director before June 1, 1910, a statement from the board of education of the school in which they were employed to the effect that they have been teaching during the past year. Blanks for this purpose may be obtained by addressing the Director.

Registration

Students will present themselves for registration at the Library on Monday, June 20, between the hours of 8 a. m. and 4 p. m. After consultation with the instructors in the various departments, study blanks will be filled out, submitted to the Director for approval, and filed with the Registrar. Students who wish courses to count for a higher degree should consult with Dean Kinley of the Graduate School. The tuition and other fees are due upon registration.

Assemblies

During the first week of the Summer Session an assembly will be held which all the students and members of the faculty are expected to attend, and at which the opportunities and advantages of summer work in the University will be explained.

Incidental Exercises

Besides the regular exercises the Summer Session provides a number of incidental exercises, which in themselves are of no little value and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students; athletic events arranged by the students; and the incidental lectures given by members of the University faculty and by men from other institutions. During the session of 1910 two such lectures will be given each week. The Physics Lecture Room is used in order that the lantern may be available for the illustration of the lectures.

Evening Lectures

Professor Edward C. Baldwin: "Hebrew Poetry".
Professor S. S. Colvin: "The Psychology of Testimony".
Dean Eugene Davenport: "How Agriculture Contributes to the Education of Man".
Professor D. K. Dodge: "Copenhagen".
Professor S. A. Forbes: "Grierson's Raid".

Professor Guy Stanton Ford: "Bismarck: the Formative Period".
Professor J. W. Garner: "Good Citizenship and Law Enforcement".
Dean Evarts Boutelle Greene: "A Virginia Planter of Two Hundred Years Ago".
Professor H. A. Hollister: "The Passing of the Spelling Book".
(Additional lectures will be announced later.)

Subjects will be announced later for lectures by Dean Thomas Arkle Clark, State Superintendent F. G. Blair, President L. C. Lord of Charleston, President David Felmley of Normal, and President W. J. Sutherland of Platteville, Wis., and others.

Amateur Dramatics

A noteworthy feature of the Summer Session of 1910 will be the amateur dramatic performance scheduled for the latter part of July. An attempt will be made to present something worth while from the standpoint of both audience and players yet with due regard to the lighter tone which is necessary to the enjoyableness of summer entertainment.

It is also probable that one of the well-known companies of woodland players will be engaged for two or more out-door performances. The plays presented are usually classic comedies. The management of dramatics will be in the hands of Mr. E. M. Halliday of the Department of English. Those who are desirous of trying for a place in the amateur cast should communicate with him as early as possible.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the University Summer Session offers marked advantages, especially with regard to preparation in professional subjects. The following excerpt from Circular No. 42 of the Office of the Superintendent of Public Instruction indicates the scope and nature of the examinations:

"State certificates will be granted in accordance with Section 177, of the general school law, which is as follows:

" '177. Certificates of qualification issued by the Superintendent of Public Instruction shall be valid in every district in the State during the good behavior of the holder. Such certificates shall be granted only upon a public examination, complete in itself, under such regulations and by such examiners, as the Superintendent of Public Instruction shall prescribe and appoint. The holder of any State certificate, while he continues to teach, shall annually, before entering upon his duties as teacher, present his certificate to the county superintendent for registration. A fee of one dollar shall be charged therefor and converted into the institute fund.' "

The examinations will be held July 26-29, 1910. Candidates may take the examination for the Elementary School Certificate, the High School Certificate, the Supervisory Certificate, or the Special Certificate, at the University, *provided that at least fifteen candidates notify the State Superintendent before June* 10, *of their wish to take the examination here.* Further information concerning the examinations may be obtained by addressing the State Superintendent of Public Instruction, Springfield, Illinois.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S 1, Principles and Methods of Teaching.

Education S 2, Educational Values and Methods; this course will be valuable for those preparing theses under Plan II.

Education S 3 or S 4, School Organization and Administration; High School Administration; either course will be valuable for those preparing theses for the State supervisory certificate.

Education S 6, History of Education; the applicant for the State supervisory certificate must take an examination in the history of education.

Education S 8, Educational Psychology; this course, in connection with Education S-1 should prepare one for the examination in educational psychology.

Attention is also called to the following courses as preparatory to the state examination in the subjects named: Biology S 1, Physics S 2a, and the various introductory courses in English and rhetoric.

Manual Training

The University of Illinois announces the introduction of courses in manual training, to be given during the Summer Session of 1910. Heretofore courses in manual training have been occasionally offered in the Summer Sessions, but no effort has been made to make the work continuous from year to year. The excellent shop equipment of the College of Engineering, the courses in education, and the facilities of the University Library make it possible for the University of Illinois to offer courses in manual traning from year to year which should attract the attention of all who are interested in this department of educational work.

Professor Fred D. Crawshaw of the University, who has been identified with manual training work in Illinois for the past twelve years, has been appointed Director of Manual Training Courses. These courses will be planned with special reference to the needs of those preparing to teach manual training and those already teaching or supervising this work. In succeeding Summer Sessions new courses will be offered as occasion demands.

Summer Courses at the Biological Station

The State Laboratory of Natural History has long maintained a biological station, devoted to the continuous investigation of the life of the Illinois River. This year the Summer Session of the University of Illinois will offer at this station elementary and advanced courses in botany, zoölogy, and physiography.

The biological station is located on the shores of Quiver Lake, a long, narrow bay of the river, just above Havana, and well known to fishermen and campers. The beautiful grounds of the Epworth League Chautauqua, situated on a high bluff overlooking the lake, and in a natural grove of forest trees, have been turned over to the University for this summer work, quarters for which will be provided in the commodious buildings used each year, a little later in the season, for the largest Chautauqua assembly in the Mississippi valley. Good board will be provided at a reasonable rate, and students who do not wish to room in the dormitories may secure tents at a very low rental. The station will be amply provided with boats.

The Biological Station will be, as heretofore, under the directorship of Professor S. A. Forbes. Professor H. B. Ward, who has been recently appointed to the chair of zoölogy at the University will be associated with Professor Forbes as vice-director, in charge of the Summer Courses.

A special circular describing the work of the Biological Station will be sent upon request.

Graduate Courses in the Summer Session

Graduate Students who expect to do work toward a master's degree during the Summer Session should register with the Dean of the Graduate School (Dean David Kinley, Room 308, University Hall).

In connection with the announcement of courses for each department, each course for which graduate credit is granted is indicated by an asterisk (*). Graduate students will understand that only courses so marked will count toward the master's degree. The hours' credit indicated for such courses, however, has reference only to undergraduate students. Graduate students are not granted credit in terms of credit-hours.

Explanation of Abbreviations

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular college year.

The number in parentheses after each course indicates the number of hours' credit given.

Unless otherwise stated each course extends through the nine weeks of the session.

The word *"daily"* in the announcements of courses indicates that the class meets five times each week (M. T. W. T. F.).

ACCOUNTANCY

(See also Economics)

Mr. Morton.

S 1. Principles of Accounting.—This course begins with a rapid review of the general principles of bookkeeping as the foundation for all work in higher accounting. The accounting for various types of business is then studied, including the changing from single to double entry for partnerships and corporations; the handling of journal entries; opening and closing entries; and general work in the treatment of balance sheets, profit and loss accounts, surplus, reserve, depreciation, etc. *Five times a week;* (2) Mr. Morton.

AGRICULTURE

Mr. Barto

S 1. Secondary School Agriculture.—This course is arranged for teachers in high schools, especially for science teachteachers in these schools, who wish to make preparation for teaching agriculture. Texts: Plumb's *The Feeding of Animals;* Brigham's *Progressive Poultry Culture;* King's *The Soil.*

The University offers exceptional advantages to teachers who wish to do this work in the Summer Session, since the experiment plots, farm crops, farm machinery, farm methods, farm buildings, orchards, gardens, silos, dairy, herds, flocks, green houses, laboratories, and library,—the whole equipment of the College of Agriculture,—is at the service of the students of agriculture for instructional use. *Daily; two periods; first six weeks;* (1½). Mr. Barto.

S 2. Common School Agriculture.—This course is especially designed for teachers of the grammar grades and of country schools, who wish to get suggestions and training that will help them in teaching agriculture in their schools. Text: *Elements of Agriculture.*

Particular attention will be given to the preparation of simple exercises in the study of soils and seeds and in problems dealing with germination and plant growth.

The work in this course will be related as closely as is practicable to the work in agriculture given in the State Course of Study for the Common Schools of Illinois. *Daily; two periods; first six weeks;* (1½). Mr. Barto.

ART AND DESIGN

Assistant Professor Lake.

S 1. Elementary.—A course in form drawing from still life, cast, and nature. The elementary principles of outline and shading will be studied in pencil, charcoal, and crayon. Lectures on the principles of perspective will be offered in connection with this course. *Two periods; daily;* (2).

Assistant Professor Lake.

S 2. Art for the Common Schools.—For supervisors of drawing, and public school teachers. In this course students plan and execute work in the several divisions of common school art study. Design will be made a feature of the work.

Black-board drawing will be emphasized. Lectures will be given upon organization, equipment, and the administrative side of the supervisor's work. *Daily; two periods;* (2).

Assistant Professor Lake.

BIOLOGY.

(At Urbana)

(See also Botany and Zoölogy.)

Mr. Pricer, Mr. Tanquary.

S 1. A course, given at the University, in field and laboratory processes and methods, and in the elementary facts and principles of botany and zoölogy. Offered with special reference to those wishing to begin a preparation for the teaching of the biological sciences in high schools. Other and more advanced courses are given at the biological station on the Illinois river. Laboratory fee, $1.50. *Daily; two periods;* (2½).

Mr. Pricer, Mr. Tanquary.

BOTANY

(At Havana)

(See also Biology)

Assistant Professor HOTTES, Dr. GLEASON, Mr. ——.

S 3. PLANT PHYSIOLOGY.—A study of the more important physiological processes of plants, intended to serve as a general introduction to the subject. Text: Ganong's *Plant Physiology*, 2d ed. *Three half-day periods; first six weeks;* (2).

Assistant Professor HOTTES, Mr. ——.

Prerequisite: High school work or its equivalent sufficient for University entrance credit.

S 4. ADVANCED PLANT PHYSIOLOGY.—Lectures, laboratory work, and assigned reading. Special problems in the physiology of fungi and of aquatic plants. *Three to six half-day periods; first six weeks;* (2-4). Assistant Professor HOTTES, Mr. ——.

Prerequisite: A college course in general elementary plant physiology or its equivalent.

S 5. CYTOLOGY.—Laboratory problems in experimental cytology. Aquatic plants of the region furnish excellent material for this work. Students are required to meet for critical discussion of current literature and for reports on progress of the problems assigned. *Three to six half-day periods; first six weeks;* (2-4).

Assistant Professor HOTTES.

Prerequisite: At least one semester's work in botany or zoology, with microscopical technique.

S 6. SYSTEMATIC BOTANY.—Lectures and laboratory work on the classification of plants and identification of species collected in the vicinity, with special attention to aquatic forms. Text: Gray's *Botany*, 7th ed. *Three half-day periods; first six weeks;* (2).

Dr. GLEASON.

Prerequisite: High school work or its equivalent sufficient for University entrance credit.

S 8. TAXONOMY AND ECOLOGY.—Studies upon selected systematic groups, or upon plant associations. *Three to six half-day periods; first six weeks;* (2-4). Dr. GLEASON.

Prerequisite: Course S 6, or its equivalent.

The following graduate courses are open, on approval, to qualified students:

*101. Cytology.—The influence of external agents on the cell. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *First six weeks.* Assistant Professor Hottes.

*102. Physiology.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. *First six weeks.* Assistant Professor Hottes.

*107. Ecology and Phytogeography.—Investigations upon plant associations and phytogeography, relations of selected areas, based on approved field work. Reports and discussions. *First six weeks.* Dr. Gleason.

CHEMISTRY

Dr. Balke, Dr. Holmes, Dr. Isham, Mr. Derick, Mr. Egan, Mr. Nickell, Mr. Gordon.

Note:—By arrangement with the instructor, students who do not wish to attend the recitations or do the laboratory work, may attend the lectures of S 1 or S 2, but University credit will not be given in such cases.

Graduate Work.—Graduate students whose major subject is not chemistry or agriculture may take for their graduate work S 5a or S 13a. Students whose major subject is chemistry may take S 111.

S 1. Elementary Chemistry.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements. The course consists of illustrated lectures, recitations, and laboratory work. The text employed is Alexander Smith's *General Chemistry for Colleges. Daily, including Saturday; three periods;* (5).

Dr. Balke, Dr. Isham, Mr. Egan, Mr. Nickell, Mr. Gordon.

S 2. Descriptive Inorganic Chemistry.—This course is a continuation of S 1 and is devoted mainly to the study of the metallic elements, their compounds, and properties. The course consists of illustrated lectures and recitations, but does not include

laboratory work. Alexander Smith's *General Chemistry for Colleges* is used as a guide. *Daily, including Saturday;* (2).

Dr. Balke, Dr. Isham, Mr. Gordon.

Prerequisite: Chemistry 1.

S 3. Qualitative Analysis.—This course consists of lectures, recitations, and laboratory practice in the ordinary processes of qualitative analysis. *Daily; three periods;* (3.)

Dr. Balke, Dr. Isham, Mr. Egan, Mr. Nickell.

Prerequisite: Chemistry 1.

*S 5a. Elementary Quantitative Analysis.—The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods. The lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to the study of solutions. The text book is Lincoln and Walton's *Exercises in Quantitative Analysis. Daily; four periods;* (5). Dr. Holmes.

Prerequisite: Chemistry 1 and 3.

S 9 and 9c. Organic Chemistry.—The work of this course consists in the discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideration of most of the important classes of derivatives of carbon. The laboratory work of the course will consist of the preparation of typical organic compounds. Remsen's *Organic Chemistry. Daily; four periods;* (5). Mr. Derick.

Prerequisite: Chemistry 2 and 3.

S 11 and *S 111. Research.—Opportunity will be given for advanced work and research in inorganic or analytical chemistry. Arrange. (2-5.) Dr. Balke, Dr. Isham, Dr. Holmes.

(Subject to approval of Graduate School Faculty.)

*S 13a. Agricultural Analysis.—This course is arranged to meet the wants of agricultural students. The work begins with the gravimetric determination and separation of the more important constituents of soils, fertilizers, and agricultural products; it includes the chemical analysis of food stuffs, such as grains, fodders, and dairy products. Tne text book is Lincoln and Wal-

ton's *Elementary Exercises in Quantitative Analysis. Daily; four periods;* (5). Dr. HOLMES.

S 17. TEACHERS' COURSE.—A study of the methods which may be followed in teaching elementary chemistry. *Two periods a week;* (1). Dr. BALKE.

S 21. PROXIMATE ORGANIC ANALYSIS.—A course of laboratory practice, for advanced students, in systematic methods for the identification of organic compounds and a study of organic mixtures. *Three periods; four days;* (2). Mr. DERICK.

Prerequisite: Chemistry 9b or 9c.

DRAWING, GENERAL ENGINEERING

Mr. PORTER.

S 1. ELEMENTS OF DRAFTING.—Required of all engineering students. Consisting of lettering, free-hand sketching, and working drawings. Lettering. Free-hand treatment through plain forms, emphasis being laid upon off-hand lettering and working-drawing titles. Text: Wilson and McMaster's *Notes on Practical Mechanical Drawing.* Sketching. Free-hand sketching of machine parts from models. Time sketches in working drawing from machine details in the shops and laboratories. Working drawings. Brief exercise in the use of tools, working drawings made from free-hand and time sketches. *Daily; three periods;* (4).

S 2. DESCRIPTIVE GEOMETRY.—Text: Church's *Descriptive Geometry.* Problems relating to the point, line, and plane; the properties of surfaces, intersections, and developments. Recitations and drawing-room work daily. *Daily; three periods;* (4).

Prerequisite: General Engineering Drawing 1.

ECONOMICS

(See also Accountancy)

Assistant Professor WESTON, Mr. MORTON.

No graduate work in Economics is offered in the Summer Session.

S. 1. PRINCIPLES OF ECONOMICS.—A general survey of the field. The forces determining economic development are studied

with special reference to the experience of the United States. This course will be accepted as the equivalent of Economics 2. Text: Seager's *Economics* (Briefer Course). *Five times a week;* (2). Assistant Professor WESTON.

Prerequisite: Two years of University credit.

S 3. BANKING.—A study of the theory and history of banking and also of present currency and banking problems in the United States. Text: Dunbar's *Chapters on the Theory and History of Banking. Four times a week;* (2).

Assistant Professor WESTON.

Prerequisite: Economics S 1, or an equivalent course in the principles of economics.

S 18. SEMINARY.—A weekly conference on commercial education and commercial teaching, a study being made of the practices of the United States and other countries. This course is intended especially for teachers of commercial subjects. The time will be arranged to suit the convenience of the class, and the amount of credit allowed will depend on the character and amount of work done. Assistant Professor WESTON, Mr. MORTON.

S 22. ECONOMIC HISTORY OF THE UNITED STATES.—A study of the general industrial development of the country with attention to the growth of some particular industries. The course is not open to students with junior or senior standing. Text: Bogart's *Economic History of the United States. Four times a week;* (2). Mr. MORTON.

EDUCATION AND PSYCHOLOGY

Professor COLVIN, Professor BAGLEY, Assistant Professor HOLLISTER, Assistant Professor ANDERSON, Assistant Professor CHARLES, Principal MCCONN.

(Courses S 2, S 3, S 7, and S 101 may be counted for graduate credit.)

S 1. PRINCIPLES OF EDUCATION.—This course will consider (a) the biological principles which condition and limit education; heredity and environment; (b) the psychological principles governing the educative process, especially the laws of attention, habit, memory, and the formation of meanings; (c) the developmental

principles which describe and explain the changes of childhood and youth; (d) the application of these principles to educational practice in connection with the course of study, methods of instruction and training, and school hygiene. *Daily; first six weeks;* (1 2-3).

Professor BAGLEY.

*S 2. EDUCATIONAL VALUES AND METHODS.—Contemporary methods of instruction and training will be described and analyzed for the purpose of determining in what way and in how far they tend toward a realization of the various values inherent in different types of subject-matter. Language, history, mathematics, and science will be considered with reference to both elementary and secondary education. Lectures, discussions, and prescribed readings in the recent literature of educational method. This course may count for graduate credit. *Four times a week;* (2).

Professor BAGLEY.

Prerequisite: Education S 1, or its equivalent.

*S 3. SCHOOL ORGANIZATION AND ADMINISTRATION.—A general course in administration taking for its foundation the historical background of the American public school system. The problems of organization and administration will be considered in their national, state, county, township, and district aspects, with comparative studies. Special emphasis will be placed on financial support, supervision, teachers' qualifications, and community adjustments. This course may count for graduate credit. Text: Dutton and Snedden's *Administration of Public Education.* Lectures, discussions, and required readings. *Daily;* (2½).

Assistant Professor HOLLISTER.

Prerequisite: Education S 1, or its equivalent.

S 4. HIGH SCHOOL ADMINISTRATION.—The organization and development of the American high school will be discussed and compared with European secondary schools. The treatment will center in the program of studies, the psychological principles involved in its organization, and the various means of making it effective. Consideration will also be given to the more important problems growing out of the school as a social group. Text: Hollister's *High School Administration.* Recitations, lectures, and discussions, with the written development of a selected problem. *Daily;* (2½). Assistant Professor HOLLISTER.

S 5. Class Management in the High School.—This course will first consider the special aims of the high school and the educational significance of adolescence; to the secondary problem, as thus outlined, it will then apply the general principles of class management. Class routine; class hygiene; discipline; planning the lesson; the recitation; the assignment; papers, topics, outside reading, note-books; teaching pupils to study; testing results; text-books and apparatus; the relation of the teacher to the school and to the community; the teacher's growth. Lectures, discussions, assigned readings. Bagley's *Classroom Management* will be used as a basis. *Three times a week;* (1½). Principal McConn.

S 6. History of Education.—The development of educational theory and practice in their relation to the history of civilization. Text: Anderson's *History of Common School Education. Daily; first six weeks*; (1 2-3). Assistant Professor Anderson.

*S 7. History of Industrial and Vocational Education.—Industry and industrial training in Egypt, Greece, Rome; industry and industrial training in the Middle Ages; the industrial revolution and its effect upon education; recent tendencies in the development of agricultural and industrial high schools, agricultural colleges, monotechnic schools, continuation schools, etc. This course is accepted for graduate credit. *Daily; first six weeks;* (1 2-3). Assistant Professor Anderson.

Prerequisite: Education S 1 and S 6 or their equivalents.

S 8. Educational Psychology.—This course considers the growth of consciousness in the child, and the analysis of the mental processes involved in learning, discussing particularly the economy and technique of learning, and the application of methods and results to the problems of the school room. Lectures, assigned reading, and demonstration of methods. *Daily;* (2½). Professor Colvin.

S 9. Round-Table for Science Teachers.—(Given at the Biological Station, Havana.) The problems and principles of secondary science-teaching will be considered with especial reference to high-school biology. Questions of equipment, materials, methods of instruction, texts, manuals, books of reference, plans for excursions, course of study, present trends in science teaching,

and the like will receive attention. Various members of the Biological Station staff will lead in the presentation and discussion of particular topics. *Three times weekly; first six weeks;* (1).

Assistant Professor CHARLES.

S 10. ROUND-TABLE FOR NATURE STUDY TEACHERS.—(Given at the Biological Station, Havana.) Elementary-school phases of scientific instruction. These will include naturally the elements of agriculture, hygiene, physical science, and all other aspects of nature-study in its broadest sense. Among the topics will be the child's attitude toward nature, shifting centers of interest, scientific method, criteria for selection of materials, setting of problems, the teaching plan, course of study, relation to secondary science, nature-study literature, etc. Illustrative field lessons will be given. *Three times weekly; first six weeks;* (1).

Assistant Professor CHARLES.

S 11. PERSONAL CONFERENCES.—(Given at the Biological Station, Havana.) This course affords opportunity for the careful discussion of individual problems in science or nature-study teaching. Advanced students or experienced teachers will have facilities for pursuing education courses in biology or nature-study, involving individual investigation of problems in education. Consideration will be given to the adaptation of science courses to local conditions and community needs. *Daily; first six weeks.* Hours and credit to be arranged. Assistant Professor CHARLES.

Prerequisite: Education S 9 and S 10 or their equivalents.

*S 101. SEMINARY.—The problems of industrial education will be considered in the seminary. Open only to graduate students. *One two-hour meeting each week.* Professor BAGLEY.

Special teachers' courses: See English S 15, English S 8, German S 9, Household Science S 3, Latin S 2, Manual Training S 2, Mathematics S 5, Physical Training for Women S 2, Physics S 18, Economics S 18, Chemistry S 17, Art and Design S 2, Physical Geography S 1, Agriculture S 1 and S 2.

ENGLISH

(See also Rhetoric).

Professor Dodge, Professor Clark, Mr. Halliday, Mr. Tietje, Mr. Warnock, Miss Collins, and Miss Henion.

S 1a. Introductiory Course.—English Literature before the Nineteenth Century. This course, with S 1b, is equivalent to English 1 as outlined in the regular catalog. *Four periods a week;* (2). Miss Henion.

Prerequisite: Three years at an approved high school.

S 1b. Introductory Course.—English Literature before the Nineteenth Century. This course, with S 1a, is equivalent to English 1 as outlined in the regular catalog. *Four periods a week;* (2). Mr. Warnock.

Prerequisite: Three years at an approved high school.

S 2a. Introductory Course.—English Literature of the Nineteenth Century. This course with S 2b is equivalent to English 2 as outlined in the regular catalog. *Four periods a week;* (2). Mr. Warnock.

Prerequisite: The same as for S 1.

S 2b. Introductory Course.—English Literature of the Nineteenth Century. This course, with S 2a, is equivalent to English 2 as outlined in the regular catalog. *Four periods a week;* (1½). Mr. Tietje.

Prerequisite: The same as for S 1.

S 15. Course for Teachers.—Some of the books in English Literature required for entrance to the University are studied with reference to their use in the school room. *Three periods a week;* (1½). Mr. Tietje.

Prerequisite: The consent of the instructor.

S 16. American Literature.—*Four periods a week;* (2). Miss Henion.

Prerequisite: English 1 and 2 or an equivalent.

S 23. Elementary Course in Shakespeare.—*Four periods a week;* (2). Mr. Tietje.

Prerequisite: English 1 and 2 or an equivalent.

S 8. Old English (Anglo-Saxon).—Grammar, prose. and short poems. *Daily;* (2½). Professor Dodge.

Prerequisite: Two years of college English, or one year of college English and one year of college German.

GRADUATE COURSES

*S 105. The Pre-Shakespearian Drama.—A critical study of Lyly, Peele, and Greene. *Daily;* (2½). Professor Dodge.

Prerequisite: Three years of college English approved by the instructor. This work must include one course in Shakespeare.

*S 101c. Research Course.—Students registered in S 105 may carry on special research work on some topic suggested by that course. Professor Dodge.

ENTOMOLOGY

(At Urbana)

Assistant Professor Folsom, Mr. Tanquary.

S 1. General Field and Laboratory Course.—A beginning course, including field, laboratory, and insectary observations on the most important economic insects available at the time, and on other forms particularly interesting to the teacher. A well-equipped insectary is available, and frequent field excursions are made under the leadership of the instructor. For agricultural students, arrangements will be made to enable them to carry under this course the required economic entomology (Entomology 4) of the fall and spring semesters. Text: Folsom's *Entomology with Reference to Its Biological and Economic Aspects. *Daily;* (2½). Assistant Professor Folsom.

S 2. Advanced Course.—This course, consisting chiefly of field and insectary work on economic and ecological subjects, is open to those who have had course S 1 or its equivalent. *Daily;* (2½). Assistant Professor Folsom.

S 3. Apiculture.—A course in bee-keeping, consisting of practical work, supplemented by laboratory studies and collateral reading, with semi-weekly discussions of the results obtained. *Daily;* (2½). Assistant Professor Folsom.

FRENCH

(See Romance Languages)

GERMAN

Dr. CHILES, Dr. WIEHR, Dr. POOR, Miss JAECK.

S 1. BEGINNERS' COURSE.—Pronunciation, grammar, composition, reading of easy texts. Text: Vos's *Essentials of German. Daily; including Saturday;* (3). Two sections.

Dr. CHILES, Miss JAECK.

S 2. INTERMEDIATE COURSE.—Grammar, composition, reading. Open to those who have had German 1 of the regular University year, or an equivalent. Text: Vos's *Essentials of German* (revised ed.); Bernhardt's *Im Zwielicht. Five times a week;* (2½).

Dr. WIEHR.

S 3. PROSE READING.—Reading of narrative prose, sight translation, composition. Open to those who have had regular course 3 in the University or an equivalent. *Five times a week;* (2½).

Dr. POOR.

S 4. READINGS FROM THE CLASSICS.—Lessing's *Minna von Barnhelm,* Schiller's *Jungfrau von Orleans.*. Open to those who have had regular course 4 in the University or an equivalent. *Five times a week;* (2½). Miss JAECK.

Students securing a grade of 85 or more and doing additional work assigned by the instructor, may supplement the work of S 1, S 2, S 3, or S 4, making it the equivalent of the University courses 1, 3, 4, or 5 respectively, the amount to be indicated at registration.

S 5. PROSE COMPOSITION.—Translation of ordinary prose into German, study of idiomatic constructions, and practice in rendering at sight. Open to those who have had two years of University work, or an equivalent. Text: Pope's *German Composition. Two times a week;* (1). Dr. CHILES.

S 7. READINGS FROM PROSE FICTION.—Rapid translation and sight reading of modern narrative prose. Open to those who have had two years of University work or an equivalent. *Five times a week;* (2½). More by arrangement, to be indicated at registration. Dr. POOR.

*S 8. Gothic or Middle-High-German.—A course will be given in Gothic or Middle-High-German, to be determined by the preferences of those who make application. Open to those who have had four years of University work, and to others by special arrangement. This course may be counted toward graduate credit. Text: Paul's *Mhd. Grammatik;* Bachman's *Mhd. Lesebuch. Three times a week;* (1½). Dr. Wiehr.

S 9—Teachers' Course.—Place, aim, and scope of the study of German in the high school; discussion of methods and the chief difficulties in teaching German. *Three times a week;* (1½).

Dr. Chiles.

S 10. History of German Literature.—Lectures, recitations, and reports on assigned collateral reading. Text: Robertson's *History of German Literature. Three times a week;* (2).

Dr. Wiehr.

HISTORY

Professor Ford, Professor Conger, Assistant Professor Larson.

S 1b. European History, 1300-1648.—This is an introductory course corresponding, for the period covered, to History 1, as given during the regular University session. It is the plan of the department to cover the whole period of medieval and modern European history in three courses in succeeding summer sessions. The course given next year will probably cover the period from 1648 to the present time. *Six hours a week;* (3).

Assistant Professor Larson.

S 3c. American History, 1850-1898. This is a part of the usual introductory course in American history which will ordinarily be given in three sections in succeeding sessions. The course offered next year will probably cover the colonial period to 1783. *Six hours a week;* (3). Professor Conger.

COURSES FOR GRADUATES AND ADVANCED UNDERGRADUATES

*S 10. The History of England in the Nineteenth Century.—*Four times a week;* (2). Assistant Professor Larson.

Prerequisite: At least two years of college work, including a general course in European or English history.

*S 11. Studies in the Era of Jeffersonian Republicanism and the War of 1812, 1800-1816.—Some practice in the critical use of documents. In the treatment of this course some attention will be paid to the special needs of teachers. *Four times a week;* (2). Professor Conger.

Prerequisite: Approximately senior college standing, including some college work in American history.

COURSES FOR GRADUATES

*S 121. Selected Topics in the History of the Nineteenth Century.—The subject selected for special study this year is the attitude of Bismarck toward certain social and economic questions of his age. Arrange hours. Professor Ford.

Prerequisite: A reading knowledge of German and a general acquaintance with the history of Europe since 1815.

HOUSEHOLD SCIENCE

Miss Crigler.

S 1. Food.—The work in this course will consist of lectures, laboratory work, and quiz. Demonstrations will be given in connection with the laboratory work. Equipment of rural schools and planning of courses and lessons for the elementary school will be considered. Text: Bevier and Van Meter's *Selections and Preparation of Food. Six periods a week; first six weeks;* (1). Miss Crigler.

Prerequisite: Chemistry 1 must precede this course if it is taken for credit.

S 2. The House.—In this course the plan, decoration, and care of the house will be considered. Text: Price's *Handbook on Sanitation. Three periods a week; first six weeks.* (1). Miss Crigler.

S 3. Special Problems of the High School Teacher.—This course will include problems connected with the teaching of food, clothing, and the home. The value of these subjects, their relation to other subjects in the curriculum, and methods of presentation will be considered. The planning of courses, planning of lessons, and the study of the kind and cost of equipment will be includ-

ed. Text: *Proceedings of Lake Placid Conference*, 1908. *Three periods a week; first six weeks;* (1). Miss Crigler.

LATIN

Dr. Canter.

S 1. Horace.—The Odes. Text: Shorey. M. W. F. (1½). Dr. Canter.

S 2. Teachers' Course. Text: Bennett and Bristol's *Teaching of Latin and Greek.* T. T. (1). Dr. Canter.

S 3. Tacitus.—Selections from the Annals. M. W. F. (1½). Dr. Canter.

S 4. Latin Writing. Text: D'Ooge. T. T. (1). Dr. Canter.

MANUAL TRAINING

(See also Mechanical Engineering.)

Assistant Dean Crawshaw, Mr. Ellis.

S 1. Organization of Manual Training.—Development of manual training; manual training systems; manual training courses in the United States; the influence of industrial education; manual training aims, methods, and limitations; study of courses; planning equipments. *Daily,* (2½). Assistant Dean Crawshaw.

S 2. Methods of Teaching Wood-Working.—Constructive design in wood-working; fundamental processes in wood-working; methods of conducting classes; practice teaching; furniture-making, including finishing and decoration; planning courses in bench-work in wood; consideration of courses in thin wood, wood-turning, and framing. Texts: Griffith's *Essentials of Woodworking;* Crawshaw's *Problems in Furniture-Making. Three hours daily.* (3). Assistant Dean Crawshaw.

(Work at the bench is under the direction of Mr. Frederick Ellis.)

MATHEMATICS

Professor Miller, Dr. Lytle, Dr. Wahlin, Mr. Emmons, Mr. Denton.

S 2. Advanced Algebra.—This course will be equivalent to that offered in the University on the same subject. The work will cover the following topics:

Progressions, binomial theorem, undetermined coefficients, partial fractions, permutations and combinations, imaginaries, logarithms, and the elements of the theory of equations. Text: Rietz and Crathorne's *College Algebra. Daily;* (2½). Mr. Denton.

S 4. Plane Trigonometry.—This course will be equivalent to that offered in the University on the same subject. Text: Conant. *Daily;* (2½). Dr. Lytle.

S 5. Teachers' Course.—In this course special attention is given to a discussion of the methods of teaching algebra and geometry, the position of mathematics in the secondary school course, the correlation of mathematics with allied subjects, a comparative study of the leading text books, and a brief history of elementary mathematics. *Daily;* (2½). Dr. Lytle.

S 6. Analytical Geometry.—The problem of geometry can be formulated and treated analytically, those of analysis can be treated geometrically. In this course algebra and geometry are united. The main topics to be discussed will be the equations of the first and second degrees and their geometric interpretation. Other loci will also be treated. There will also be a brief account of the analytical geometry of three dimensions. Text: Tanner and Allen. *Daily;* (2½). Mr. Emmons.

S 7. Differential Calculus.—This course is equivalent to that offered in the University as Mathematics 7. Text: Townsend and Goodenough. *Daily;* (2½). Mr. Denton.

S 9. Integral Calculus.—This course is equivalent to that offered in the University as Mathematics 9. *Daily;* (2½).

Dr. Wahlin and Mr. Emmons.

S 15. Seminary and Thesis. (2½).

Professor Miller.

S 16. Differential Equations.—A first course in the integration of differential equations. Text: Cohen. *Daily;* (2½).

Dr. Wahlin.

Prerequisite: Differential and Integral Calculus.

*S 120. Elementary Theory of Groups.—The study of the groups which present themselves in arithmetic, geometry, and trigonometry is followed by a determination and study of those which

can be represented on a small number of letters. Lectures. *Three periods a week.* Professor Miller.

*S 10. Theory of Equations and Determinents.—A continuation of the theory of equations given in college algebra. Text: Bôcher; *Introduction to Higher Algebra. Daily;* (2½).

Professor Miller.

MECHANICAL ENGINEERING

(See also Manual Training.)

Assistant Professor Gill, Mr. Scroggin, Mr. Goben, Mr. Lanham, Mr. Ellis, Mr. Casper.

These courses will be the equivalent of those offered in the same subjects during the University year.

S 1a. Pattern Shop.—This course includes the care and use of tools, and the construction of patterns, core boxes, match boards, etc. The shop is equipped with tools, benches and machines such as are found in modern pattern shops. *Five three-hour periods a week;* (3). Mr. Ellis.

S 1b. Forge Shop.—This course will include work in shaping and welding iron and steel; dressing and tempering lathe and other tools; annealing and case hardening. *One two-hour, and two three-hour periods a week;* (1½). Mr. Lanham.

S 1c. Foundry.—Care and management of the cupola; floor, bench, and machine molding; green and dry sand cores; mixing and casting brass, aluminum, and other soft metals. *Two three-hour and one two-hour periods a week;* (1½). Mr. Casper.

S 2a. Machine Shop.—Exercises in chipping and filing; elementary work on lathe, drill press, shaper, planer, and grinding machine. *Five three-hour periods a week;* (2½).

Mr. Goben.

S 2b. Advanced Machine Shop.—This course includes the use of milling machine, screw machine, gear cutter, boring mill, and turret lathe; erecting and testing machines and gas engines. *Five three-hour periods a week;* (2½). Mr. Goben.

Lecture on tools and shop processes are given frequently, and inspection trips to shops in the local and adjoining towns are made

in connection with all classes in shop practice. A student may finish one or both semesters' shop work as given in the freshman year, or either semester's work of the sophomore year.

MECHANICS, THEORETICAL AND APPLIED

Assistant Professor ENGSTROM, Mr. ENGER, Mr. FLEMING.

S 7. ANALYTICAL MECHANICS.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics. Daily;* (3). Assistant Professor ENGSTROM.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 8. ANALYTICAL MECHANICS.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics. Daily;* (2½). Mr. ENGER.

Prerequisite: Mathematics 9 and T. & A. M. 7.

S 9. RESISTANCE OF MATERIALS.—Training in the elementary principles of the mechanics of materials, with experiments and investigations in the materials laboratory to verify the experimental laws; problems in ordinary engineering practice to train the student in the use of his knowledge. This course covers the same ground both in text-book, problem work, and in experiments in the materials testing laboratory as T. and A. M. 9. Merriman's *Mechanics of Materials. Daily in class-room and two double periods in laboratory;* (3½). Mr. FLEMING.

Prerequisite: T. and A. M. 7 and registration in T. and A. M. 8.

S 10. HYDRAULICS.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observation and measurement of pressure, velocity, and flow, in power and efficiency, and in the determination of experimental coefficients. Hoskin's *Hydraulics. Four times a week and two double periods in laboratory;* (3). Mr. ENGER, Mr. FLEMING.

Prerequisite: T. and A. M., 8.

With the opening of the hydraulic laboratory for the Summer School, arrangements may be made to use its facilities for special experimental work.

MICROSCOPICAL TECHNIQUE

Mr. La Rue.

(At Havana.)

S 1. In this course the student will be taught approved methods for preserving and mounting plants and animals for microscopical study either as whole objects or in sections. The student will have actual practice in killing, fixing, staining, and sectioning plant and animal tissues, and in making temporary and permanent mounts. Incidentally the student will accumulate a collection of useful objects for study and subsequent work in teaching. Especial attention will be given to those methods which do not require elaborate apparatus. At the same time abundant apparatus and supplies will be taken from the University for all students and special apparatus for such as register beforehand for more advanced work. Laboratory fee, $2.00. *Two half-days per week;* (1). Mr. LaRue.

PHILOSOPHY

Professor Colvin.

S 1. Introduction to Philosophy.—This course takes up the problems of epistemology, cosmology, and ontology in the light of their historical settings and their modern bearings. Text: Paulsen's *Introduction to Philosophy. Daily;* (2½).

Professor Colvin.

PHYSICAL GEOGRAPHY

(At Havana.)

Professor ———— and Mr. Hutton.

S 1. Course for Teachers.—This course deals with the interpretation of the most common topographic forms met with in the Mississippi Valley and the processes which have brought them into existence. It is designed especially for those who are teaching in secondary schools, and can be admirably illustrated from the variety of topographic forms in the vicinity of the station. Text: Davis and Snyder's *Physical Geography,* or Salisbury's *Advanced*

Physiography. Two half-day periods in the field, and one in the laboratory; first six weeks; (2).

Professor ———— and Mr. HUTTON.

S 2. THE PROCESSES OF PHYSICAL GEOGRAPHY.—A discussion of the broad problems of the science, and the philosophy of physiographic processes. Lectures, laboratory, and field work. Text: As for course S 1. *Three or six half days; first six weeks;* (2-4)

Professor ————.

Prerequisite: An elementary course in Physical Geography.

PHYSICAL TRAINING FOR MEN

Director HANA, Mr. NORRIS.

S 1. GYMNASIUM PRACTICE.—Class drills with hand apparatus in conjunction with elementary heavy apparatus work. (Arrange time.) Mr. HANA.

S 2. GYMNASIUM PRACTICE.—Advanced heavy apparatus work. (Arrange time.) Mr. HANA.

SWIMMING.—The large pool offers ample facilities for swimming, and instruction will be given in all branches of the sport. Special attention will be given to beginners. (Arrange time.)

Mr. NORRIS.

PHYSICAL TRAINING FOR WOMEN.

Miss WILLIAMS, Miss BROOKS, Miss BROADDUS.

S 1. PRACTICE AND THEORY: *Aim*: To call attention to, and give means of correcting common faults of carriage, posture, etc. This course offers a short talk each hour on personal hygiene, including clothing, bathing, sleep, diet, exercise, and other personal habits. These talks are followed by hygenic and corrective exercises illustrating the points brought out. *Daily; first six weeks.*

Miss WILLIAMS, Miss BROADDUS.

S 2. PRACTICE.—This course offers opportunity for teachers who desire material for drills suitable for school children. It includes elementary drills in free gymnastics, light apparatus, folk and gymnastic dancing, with opportunity for tennis, lawn-bowling, and other games. *Daily; first six weeks.*

Miss WILLIAMS, Miss BROADDUS.

S 3. Swimming.—The swimming pool of the Woman's gymnasium will be open daily, affording opportunity for instruction and practice during nine weeks. Miss Williams, Miss Brooks.

PHYSICS.

Assistant Professor Schulz, Assistant Professor Kunz, Mr. Williams, Mr. Hyslop.

S 2a. General Physics.—Lectures with experimental illustrations and recitations. The topics for 1910 are mechanics and heat. Text: Ganot's *Physics. Three periods a week;* (1).
Mr. Williams, Mr. Hyslop.

Prerequisite: Plane geometry and high school algebra. Plane trigonometry desired.

S 2b. General Physics Laboratory.—A laboratory course in mechanics and heat to accompany S 2a. Text: Watson's *Laboratory Manual. Three two-hour periods a week;* (1½).
Mr. Williams, Mr. ——.

Prerequisite: Same as for S 2a.

S 4. Electrical and Magnetic Measurements.—Laboratory exercises with discussions and recitations. *Three three-hour periods a week;* (1½). Assistant Professor Schulz.

Prerequisite: Physics 1 and 3, or 2a and 2b; Mathematics 7 and 9.

S 18. Teachers' Course.—Discussion of practical problems that confront the teacher in high school physics. A laboratory course in physics suitable for the high school will be outlined and some of the experiments performed. *Two two-hour periods each* week; (1). Assistant Professor Schulz.

S 20a. Lectures and Recitations Based on Edser's Light.—Laboratory experiments in dispersion, interference, diffraction, and polarization phenomena. This course should be of special interest to teachers who wish to gain experience in setting up and performing their own lecture experiments. The work being individual, may be arranged for graduate students. *Three three-hour periods a week;* (1½). Assistant Professor Schulz.

Prerequisite: A course of lectures and laboratory work in general physics, such as Physics 1 and 3, or 2a and 2b.

S 32. Theoretical Electricity.—A course of lectures introductory to more advanced courses in this subject. *Three periods a week for first six weeks;* (1). Assistant Professor Kunz.

Prerequisite: See the instructor.

S 33. Introduction to Mechanics.—A course of lectures leading up to more advanced work. *Four periods a week for first six weeks;* (1). Assistant Professor Kunz.

Prerequisite: See the instructor.

S 31. Investigation of Special Problems.—An advanced course in the laboratory or in design and calculation. A problem is chosen and worked out with the advice and direction of the instructor. This course may be arranged for graduate credit. (1 or 2). Assistant Professor Schulz, Assistant Professor Kunz.

* 133. Seminary and Thesis.—This course is primarily for graduate students. (1 or 2).

Assistant Professor Schulz, Assistant Professor Kunz.

POLITICAL SCIENCE.

Professor Garner.

S 1. Federal Government in the United States.—This is a study of the nature and organization of the federal system of government in the United States, the federal constitution, the nature of the union, the powers and rights of the states, the organization and procedure for both houses of Congress, the presidency, and federal courts. This course is intended to give an introductory survey of national and state government in the United States and is recommended to teachers of history and civics. *Daily; first six weeks;* (1 2-3). Professor Garner.

S 2. The Elements of International Law.—This course deals with the nature and development of the law of nations; its source and present status, the equality of states, the doctrine of intervention, the laws of war and of peace, the rights and duties of neutrals, the arbitration movement, and the work of the two Hague conferences, the Monroe doctrine, and the position of the United States as a world power among the nations. *Daily; first six weeks;* (1 2-3). Professor Garner.

PSYCHOLOGY

Professor Colvin.

(See Education and Psychology.)

RHETORIC

(See also English).

Professor Clark, Mr. Halliday, Mr. Warnock, Miss Collins.

S 1a. Rhetoric and Themes.—This course is the same as the first semester of Rhetoric 1, as outlined in the regular catalog. *Daily;* (3). *Two sections.* Miss Collins and Miss Henion.

Prerequisite: Three years at an approved high school.

S 1b. Rhetoric and Themes.—This course is the same as the second semester of Rhetoric 1, as outlined in the regular catalog. *Daily;* (3). Miss Collins.

Prerequisite: The same as for S 1a.

S 3. Daily Themes.—Five short themes a week with a four-page theme every fortnight. *Three periods a week;* (2).

Professor Clark and Mr. Warnock.

Prerequisite: Rhetoric 1 or an equivalent.

S 4. The Art of Debate.—Brief writing and extemporaneous presentation of arguments in formal debate. Text: Foster's *Argumentation and Debating. Two periods a week;* (1).

Mr. Halliday.

S 5. Extempore Speaking.—Platform discussion of current events, practice in after-dinner speaking, impromptu debates, etc. Text: Phillips's *Effective Speaking. Two periods a week;* (1).

Mr. Halliday.

Prerequisite: Rhetoric 1 or an equivalent.

S 7. Public Speaking.—An introductory course in public speaking; vocal, breathing, action, and declamation exercises, supplemented by text-book and individual instruction. Text: Fulton and Trueblood's *Public Speaking. Four periods a week;* (2).

Mr. Halliday.

Prerequisite: Three years at an approved high school.

S 8. Theme Correcting.—A course primarily for teachers of English composition. Lectures, discussions, and written exercises.

The object of the course is to develop the most helpful and suggestive methods of correcting themes. *Two periods a week; first six weeks;* (2-3). Professor Clark.

Prerequisite: The consent of the instructor.

ROMANCE LANGUAGES

Associate Professor Carnahan, Dr. Jones.

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easier texts. Texts: Fraser and Squair's *Elementary French Grammar;* Bacon's *Une Semaine a Paris;* Siccard's *Easy French History. Daily;* (2½). Dr. Jones.

S 2. Reading of Modern French.—Rapid reading of modern authors for students who have had French 1 (both semesters) of the regular University year, or its equivalent. Composition, conversation. Books will be used from the following list: *Everyday French,* Bronson; *Colomba,* Mérimee; *Pêcheur d' Islande,* Loti; *Huit Contes Choisis,* Guy de Maupassant; *La Mare au Diable,* George Sand; *Bataille de Dames,* Scribe and Legouvé; *Mademoiselle de la Seiglière,* Sandeau. *Daily; first six weeks;* (2).

Associate Professor Carnahan.

S 3. Supplementary Work.—Distinctly superior students may supplement the work of either of the preceding courses, so as to earn a full first semester's credit of four hours.

For S 1, Dr. Jones. For S 2, Associate Professor Carnahan.

S 4. Advanced Composition and Conversation.—This course aims to give some facility in writing and speaking idiomatic French. Open to students who have had two years of University French, or an equivalent. *Two periods a week.* (1, or more by arrangement.) Dr. Jones.

S 5. French Drama of the Nineteenth Century.—A study of a few masterpieces of the century. Rapid reading, lectures, and reports on collateral reading. Books will be used from the following list: *Ruy Blas* or *Hernani,* Hugo; *Cyrano de Bergerac* or *Les Romanesques,* Rostand; *Trois Comédies,* Alfred de Musset; *Le Pater,* Coppée; *Question d'Argent,* Dumas *fils. Three periods a week; first six weeks.* (1½, or more by arrangement.)

Associate Professor Carnahan.

*S 125. Seminar.—An opportunity is here offered for graduate work. Associate Professor Carnahan.

SOCIOLOGY

Professor Hayes.

S 1. Social Conditions and Problems in the United States.—The substance of this course will be mainly facts rather than theory, but the facts will point to certain practical conclusions. The following topics will be included: Immigration, The Negro, Poverty, Crime, The Great City, The Rural Community. *Daily; first six weeks;* (1 2-3). Professor Hayes.

*S 3. Comparative and Genetic Sociology.—A description and comparison of different modes of activity (economic, political, legal, ethical, religious, domestic, etc.) as they prevail or have prevailed among people at different stages of progress, savage, barbarous, and civilized; inductions from such facts; including a theory of social evolution, and of the method of progress. Graduate credit for this course may be secured by those who meet certain special reading requirements. *Daily; first six weeks;* (1 2-3).

Professor Hayes.

SPANISH.

Dr. Jones.

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easy texts. Texts: Loiseaux's *Spanish Grammar,* and *Spanish Reader. Daily;* (2½). Dr. Jones.

S 3. Supplementary Work.—An opportunity is offered to do supplementary work in Spanish similar to that described under French. Open only to distinctly superior students. Dr. Jones.

SPANISH

(See Romance Languages.)

ZOOLOGY

(At Havana.)

(See also Biology)

Professor WARD, Professor SMITH, Professor ————————, Mr. HART, *and Assistants.*

S 1. GENERAL ZOÖLOGY.—A series of vertebrate and invertebrate animals is studied from the ecological, physiological, and morphological points of view. The abundance and variety of animals living in their natural environment and readily available to the student at all times, afford ample opportunity for comparative studies. The work of this course will be especially adapted to the needs of teachers of zoölogy. Lectures, laboratory and field work. *Daily; first six weeks;* (2-5).

Professor ———————— and Assistants.

S 2. FAUNISTIC ZOÖLOGY, INCLUDING ENTOMOLOGY.—The collection, preservation, and identification of various kinds of aquatic animals, including insects, will constitute the major part of the work of the course and will give a much more comprehensive knowledge of the animals of fresh-water situations than is gained from ordinary elementary courses. *Three times a week; first six weeks;* (2). Professor SMITH, Mr. HART.

Prerequisite: An elementary course in Zoölogy.

S 3. FIELD ORNITHOLOGY.—A course devoted to the observation and identification of birds. Methods of making skins and mounting specimens will be demonstrated. *Two or three half-days; first six weeks;* (1-2). Professor SMITH.

S 21. INTRODUCTION TO RESEARCH.—Students looking forward to graduate work and to independent investigations will be assigned definite topics, usually repeating the work of earlier investigators, and will be directed in working out the morphology, life

history, or reciprocal relations of invertebrate forms. Laboratory work with stated conferences and assigned reading. *First six* weeks; (2-5). Professor Ward.

*S 117. Faunistic Zoölogy.—Problems in taxonomy, distribution and faunal groups with field work, conferences, and lectures. The department is especially favored in the work of this course by the fact that a natural history survey of the state is in progress at the Biological Station, and that students have the advantage of the collections, library, apparatus, and operations of this survey as an aid to their personal studies. *Three to five times a week; first six weeks;* (1 2-3). Professor Smith.

*S 121. Individual Research Courses.—The Biological Station affords unusual opportunities for graduate students to conduct investigations on animals in their natural environment. This year especial emphasis will be laid on the following lines:

(a) Morphology and Life History of Invertebrate Forms, and Problems in Animal Parasitology. Professor Ward.

(b) Faunistic and Taxonomic Studies. Professor Smith.

UNIVERSITY OF ILLINOIS LOCATION

The University of Illinois is situated in Champaign County in the eastern central part of the State between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis Railroads. The cities of Urbana and Champaign have together a population of 20,000.

The institution was incorporated February 28, 1867, under the name, The Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

BUILDINGS AND GROUNDS

The land occupied by the University and its several departments embraces about two hundred and twenty acres, besides a farm of four hundred acres. The buildings at Urbana are twenty-three in number, and consist of the Agricultural Building, the Agronomy Building, the Armory, the Astronomical Observatory,

the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the Library, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, The Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop and Foundry. The Physics Building and a large addition to the Natural History Building have been completed this year.

LIBRARIES

The general University library, the library of the State Laboratory of Natural History, that of the Agricultural Experiment Station, and that of the College of Law are all at the University in Urbana.

The general University library, including the Agricultural Experiment Station library, contains 115,000 volumes and pamphlets. The reading room contains over 3,100 bound volumes of periodicals. The University has a subscription list of 1,112 periodicals, the current numbers of which are kept in the east-tower reading room The library of the State Laboratory of Natural History contains 6,060 volumes and 16,440 pamphlets. The Library of the College of Law contains the Federal and State Reports, the leading text-books, and the leading periodicals. The School of Education has made a special collection of about 1,500 books and 3,000 pamphlets, which are kept in the rooms of the School in University Hall. This collection contains a very good assortment of modern text-books, and copies of the course of study of nearly all the large city school systems.

ATHLETICS

Although both the men's and the women's gymnasium will be used in some part for the regular class work in Physical Training, they are nevertheless open to students not registered in those courses for the purposes of general recreation and exercise. Both of the gymnasiums are new and well equipped. Each contains swimming pool,

shower, and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts upon the University campus are open to the student body. The general athletic fields will be open to the students. The golf links, which are in the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, baseball clubs, etc.

BOARDING AND LODGING

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board can be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

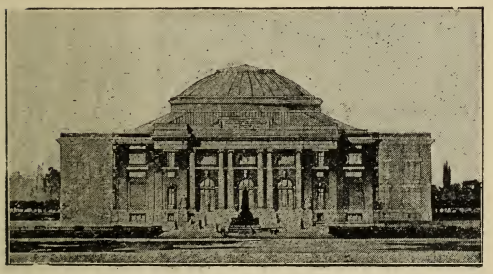
For further information on any matter connected with the Summer Session, address the Registrar or,

W. C. BAGLEY, Director,
Room 217, University Hall,
Urbana, Illinois.

The University of Illinois

Summer Session

June 26 to August 19, 1911



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CALENDAR

SUMMER SESSION

June 26, 1911, Monday	Registration Day
August 19 and 20, Friday and Saturday	Final Examinations

FIRST SEMESTER

September 13 to 16, Wednesday to Saturday	Entrance Examinations
September 18 and 19, Monday and Tuesday	Registration Days
September 20, Wednesday, 8 A. M.	Instruction Begins

REGISTRATION OF STUDENTS

'94-'95	810
'95-'96	855
'96-'97	1075
'97-'98	1585
'98-'99	1825
'99-'00	2234
'00-'01	2505
'01-'02	2950
'02-'03	3288
'03-'04	3594
'04-'05	3729
'05-'06	4070
'06-'07	4316
'07-'08	4743
'08-'09	4977
'09-'10	5118

OFFICERS OF THE SUMMER SESSION

EDMUND JANES JAMES, Ph.D., LL.D., President of the University

COMMITTEE ON SUMMER SESSION

DAVID KINLEY, Ph.D., LL.D., Dean of the Graduate School.

EUGENE DAVENPORT, M.Agr., LL.D., Dean of the College of Agriculture.

EDGAR JEROME TOWNSEND, Ph.D., Dean of the College of Science.

EVARTS BOUTELLE GREENE, Ph.D., Dean of the College of Literature and Arts.

THOMAS ARKLE CLARK, B.L., Dean of Men.

WILLIAM CHANDLER BAGLEY, Ph.D., Director of the School of Education; *Chairman, and Director of the Summer Session.* (Office, Room 217, University Hall.)

SAMUEL WALKER SHATTUCK, C.E., Comptroller.

CHARLES MAXWELL MCCONN, A.M., Registrar and Secretary. (Office, Natural History Building.)

STAFF OF INSTRUCTION

SUMMER SESSION, 1911

Anderson, Lewis Flint, Ph.D., Assistant Professor of Education.

Anderson, Frank Maloy, Professor of History, University of Minnesota.

Bagley, William Chandler, Ph.D., Professor of Education.

Baker, C. J., A.B., Assistant in Chemistry.

Balke, Clarence William, Ph.D., Assistant Professor of Chemistry.

Barto, Philip Stephen, A. M., Assistant in German.

Bogart, Ernest Ludlow, Ph.D., Associate Professor of Economics.

Canter, Howard Vernon, Ph.D., Associate in Classics.

Carnahan, David Hobart, Ph.D., Associate Professor of Romance Languages.

Carscallen, George Ernest, A.M., Associate in Mathematics.

Colvin, Stephen Sheldon, Ph.D., Professor of Psychology.

Crathorne, Arthur Robert, B.S., Ph.D., Associate in Mathematics.

Daniels, Arthur Hill, Ph.D., Professor of Philosophy.

Derick, Charles George, Ph.D., Instructor in Chemistry.

De Vries, Louis, A.M., Instructor in German.

Dickinson, Nellie Major, B.S., Assistant in Household Science.

Dodge, Daniel Kilham, Ph.D., Professor of English.

Ellis, Frederick, Instructor in Wood Shop.

Enger, Melvin Lorenius, B.S., Instructor in Theoretical and Applied Mechanics.

Fargo, Roy Newton, B.S., Assistant in Physical Culture for Men.

Flocken, Ira Graessle, A.M., Assistant in Economics.

Folsom, Justus Watson, Sc.D., Assistant Professor of Entomology.

Galloway, Thomas Walton, Ph.D., Professor of Biology, James Millikin University.

Garner, James Wilford, Ph.D., Professor of Political Science.

Gaut, Rosa Lee, Assistant in Physical Training for Women.

Glasgow, Robert Douglas, A.B., Assistant in Entomology.

Greene, Evarts Boutell, Ph.D., Professor of History.

Halliday, Ernest Milton, A.B., LL.B., Associate in English (Public Speaking).

Hana, Leo Gregory, Director of Men's Gymnasium.

Hatch, Ellen Birdseye, A.B., Instructor in Physical Training, Oberlin College.

Hayes, Edward Cary, Ph.D., Professor of Sociology.

Hendrix, William Samuel, A.M., Assistant in Romance Languages.

Hill, Mabel, Assistant in Art and Design.

Hollister, Horace Adelbert, A.M., High School Visitor.

Hottes, Charles Frederick, Ph.D., Assistant Professor of Botany.

Hutton Joseph Gladden, M.S., Assistant in Geology.

Jones, Harrie Stuart Vedder, Ph.D., Associate in English.

Kelley, Truman Lee, A.B., Assistant in Psychology.

Koller, Armin Hajman, A.M., Assistant in German.

Lake, Edward John, B.S., Assistant Professor of Art and Design; Acting Head of Department.

Lanham, Edgar Thomas, Instructor in Forge Work.

La Rue, George Royer, A.M., Assistant in Zoölogy.

Lehenbauer, Philip Augustus, A.M., Assistant in Botany.

Madden, Irwin Arthur, B.S., Assistant in Agricultural Education.

Mac Innes, Duncan A., Ph.D., Assistant in Chemistry.

McCarthy, Ellen S., Ph.D., Instructor in Chemistry.

Minnick, John Harrison, A.M., Assistant in Mathematics.

Nuckolls, Elizabeth, Assistant in Physical Training for Women.

Noerenberg, Clarence Eugene, B.S., A.E., A.B., Instructor in Theoretical and Applied Mechanics.

Pincomb, Helena Maude, B.S., Instructor in Household Science for Secondary Schools.

Poor, Charles Marshall, Ph.D., Instructor in German.

Scroggin, David L., Instructor in Mechanical Engineering.

Seely, Fred B., B.S., Instructor in Theoretical and Applied Mechanics.

Shaw, James Byrne, Sc.D., Assistant Professor of Mathematics.

Simonds, William Edward, Ph.D., Professor in English in Knox College.

Smith, Mrs. Constance Barlow, Instructor in Sight-Singing, Ear-Training, and in charge of Public School Methods Department.

Smith, William Herschel, B.S., Assistant in Animal Husbandry.

Steward, Robert Kent, B.S., Instructor in General Engineering Drawing.

Strachan, Earle Kenneth, Assistant in Chemistry.

Taylor, Thomas Smith, Ph.D., Instructor in Physics.

Thomas, Frank Waters, A.M., Principal of the Academy.

Tietje, Ralph Earle, A.B., Assistant in English.

Van Doren, Carl Clinton, A.M., Instructor in English and Comparative Literature, Columbia University.

Wahlin, Gustaf Eric, Ph.D., Instructor in Mathematics.

Wahlstrom, Leonard Willliam, Teacher of Manual Training, F. W. Parker School, Chicago.

Warnock, Arthur Roy, A.B., Instructor in English.

Washburn, Edward Wright, Ph.D., Assistant Professor in Chemistry.

Watson, Floyd Rowe, B.S., Ph.D., Assistant Professor of Physics.

Williams, Elmer Howard, Ph.D., Instructor in Physics.

Woodrow, Jay Walter, A.B., Assistant in Physics.

GENERAL STATEMENT

The Summer Session of the University of Illinois for 1911 will open on June 26, and close on August 19, making a term of *eight weeks*. The opening day will be devoted to registration. The exercises of the first week will extend through Saturday in order to give five full days of class work. The final examinations will be held on Friday and Saturday of the last week. In this way, the total number of days of actual instruction will be made equal to one half of the Fall semester, and university credit will be granted on this basis as heretofore.

All of the courses will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Session a certificate of such attendance, but university credit will not be given for six-weeks courses.

The number of credit-hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating nine credit-hours or less. For students registering after the first week of the Session, there will be a proportionate reduction in the amount of university credit that may be earned.

Purpose

The primary purpose of the Summer Session is to meet the needs of teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. The greater number of courses offered are designed particularly for high-school teachers, supervising officers, and teachers of special subjects (art, music, manual training, domestic science, agriculture, etc.) and for college instructors, school supervisors, and principals who are working for advanced degrees. At the same time, students who may not fall within these groups are welcomed at the Session, and a number of courses of a more general nature are provided to meet their needs.

Attention is called to the fact that the Summer Session courses offer work equivalent to the half-semester of the regular University year. Consequently the work of four summers will equal the work of one academic year.

Fees

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee is charged in some courses for materials used. Any single course may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken. A single course is understood to mean not more than two and one-half credit-hours.

Scholarships

By ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must either pass the entrance examinations, or present a diploma from an accredited high school or other evidence of having completed the requisite amount of preparatory work.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, Class of 1911, and to persons (otherwise qualified) who have not been teachers, but who are under contract to teach in the State during the coming year.

Those who wish to take advantage of the scholarship privilege should present to the Director of the Session prior to June 10, 1911, a statement from the board of education employing them to the effect that they have either been teaching during the past year or are under contract to teach during the coming year. Normal-school graduates may present either a diploma or a written statement from the President of the normal school certifying that the course has been completed.

Application-blanks for scholarships may be obtained by addressing the Director.

Registration

Students will present themselves for registration on Monday, June 26. *The registration offices will be upon the second floor of*

the Natural History Building. A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first consult with Dean David Kinley of the Graduate School. (Dean Kinley's office is Room 309, University Hall.)

All fees are due upon registration, and should be paid at the Business office, Room 323, Natural History Building.

General Assembly

On the first Thursday of the Session, at 4 P. M., an Assembly will be held in the Chapel of University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc., and the opportunities and advantages of summer work at the University will be explained.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which are in themselves of no little value, and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

Evening and afternoon lectures of a general nature will be given each week. In some cases, these will extend through the week, and treat somewhat systematically, although in a non-technical way, certain topics that are of especial interest to teachers. Such lectures are commonly placed at four o'clock in the afternoon. Single lectures are commonly given on either Tuesday or Thursday evenings at 7:30.

Arrangements have been made with the Ben Greet Players for a series of open-air performances.

Series of public lectures will be given by Dean T. A. Balliet, of New York University, Professor M. V. O'Shea of the University of Wisconsin, Professor C. F. Hottes and Professor E. C. Baldwin, of the University of Illinois, Mr. L. W. Wahlstrom of the F. W. Parker School, Chicago, and others to be announced later.

The Dramatic, Debating, and Literary Clubs

The Dramatic club will be reorganized during the Summer Session of 1911. Mr. E. M. Halliday, of the Department of Public Speaking, will supervise the work of the club, and a play will probably be presented during the latter part of the Session. The growing importance of the dramatic factor in the English work of the high schools makes this feature of the Session particularly attractive to high-school teachers who wish to learn something of the way in which such work may be organized and supervised.

Mr. Halliday will also help in the reorganization of the debating and literary clubs which were interesting and valuable features of the student life during the last Session.

Teachers' Conferences

The informal features of the Session will also include a continuation of the conferences of teachers, superintendents, and principals. The importance of these round-table discussions in supplementing the more formal class exercises was amply demonstrated by the experience of the last Session. Mr. H. A. Hollister, High School Visitor of the University, will again lend his aid in organizing and conducting these conferences.

Music Courses and the Summer Session Chorus

An important new feature of this year's Session will be the introduction of courses in public-school music. These courses will be given by Mrs. Constance Barlow Smith, who has, for some years, had charge of similar courses in the University School of Music. The technical preparation of supervisors of music will receive important emphasis, but certain features of the work will also aim to meet the needs of superintendents and principals who may wish to gain an acquaintance with musical theory and methods of teaching that will enable them intelligently to participate in

the more general problems of organization and supervision. Finally the side of appreciation will not be neglected. Arrangements will be made to demonstrate the various methods of bringing the best music into the public schools through the medium of the phonograph, the piano-player, and other devices.

In connection with the courses in music, a chorus will be organized among the students. This again will form a valuable object lesson to high-school teachers who wish to form similar organizations in their own schools.

For those who wish private lessons in voice, piano, violin, and musical theory, excellent opportunities will be provided. It will also be possible to secure private instruction in band instruments. Prospective students of the Session who wish to avail themselves of these opportunities should address Director C. H. Mills of the School of Music.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects. The following excerpt from Circular No. 53 of the Office of the State Superintendent of Public Instruction indicates the method of securing State certificates.

"Certificates of qualification issued by the Superintendent of Public Instruction shall be valid in every district of the State during the good behavior of the holder. Such certificates shall be granted only upon a public examination, complete in itself, under such regulations and by such examiners, as the Superintendent of Public Instruction shall prescribe and appoint. The holder of any State certificate, while he continues to teach, shall, annually, before entering upon his duties as a teacher, present his certificate to the county superintendent for registration. A fee of one dollar shall be charged therefor and covered into the institute fund."

The examination will be held July 25 to 28, 1911. Candidates for the "General Certificate" must take the examination in Springfield. The "State Elementary-School Certificate", the "State High-School Certificate", and the "State Supervisory Certificate" may be obtained by examinations held on the above dates at the University of Illinois, *provided that at least fifteen applicants notify the State Superintendent prior to June 10, 1911, of their wish to take the examination here.* Further information concerning the examinations may be obtained by addressing Hon. F. G. Blair, Springfield, Illinois.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S-1, Principles and Methods of Teaching.

Education S-2, Educational Values and Methods. (This course will be valuable for those preparing theses under Plan II.)

Education S-3 or S-4; School Organization and Administration; High School Administration. (Either course will be valuable for those preparing theses for the State Supervisory Certificate.)

Education S-6; History of Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-8; Educational Psychology. (This course, in connection with Education S-1 should prepare for the examination in educational psychology.)

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Manual Training

The courses in manual training which were offered in 1910 will be repeated during the coming session. They will be in charge of Mr. L. A. Wahlstrom of the Francis W. Parker School in Chicago. Mr. Wahlstrom holds a certificate from Teachers' College, Columbia University, and has had both the training and the experience that are essential to effective instruction in this field. The demand for well qualified teachers of manual training is becoming more and more insistent each year, and the University is not now able to supply even a small fraction of the teachers of manual training that are called for by the schools of the State. The summer work is particularly important in that it will give to the student who has had good preparation in the general engineering courses the ability to adapt his knowledge and skill to the organ ization of manual training work in the elementary and secondary schools.

Agriculture

The demand for teachers of agriculture in the high schools has led to an extension of the summer offerings in this subject. Hitherto only two courses have been given, and these have been largely limited to the educational phases of agriculture. These will be continued this year under the direction of Mr. I. A. Madden who

first organized the agricultural work in the John Swaney High School. Two additional courses will be given in animal husbandry by Mr. W. H. Smith. It is hoped that the work may be gradually extended until all of the important departments of agricultural study are adequately represented.

Graduate Work in the Summer Session

The increasing number of teachers, principals, and superintendents who wish to work for advanced university degrees justifies the emphasis which the Summer Session is placing upon graduate study. The laboratories of chemistry, physics, botany, zoölogy, and psychology will be available for advanced work. Additions to the library during the past year have been particularly important in completing sets of periodicals, monographs, and other materials so essential to effective graduate study.

Teachers of the State who already hold a Bachelor's degree from a college of recognized standing may be admitted to the Graduate School during the Summer Session. It is possible to complete the work for the Master's degree entirely by summer residence,—four summer sessions being normally required.

It is well for those wishing to register for advanced degrees to communicate with Dean David Kinley before the opening of the Session.

Summer Courses in Library Training

Beginning Monday, June 26, 1911, and continuing for six weeks the Library School will conduct a Summer Session *to which will be admitted only those actually employed as librarians or library assistants or under definite appointment to serve in such positions.* The curriculum will be planned to meet especially the needs of workers in public libraries and in high school libraries of Illinois and no tuition fee will be charged students entering from this State; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by Miss Frances Simpson, M.L., B.L.S., a member of the faculty and Miss Ida F. Wright, B.L.S., assistant librarian of the Lincoln Library, Springfield. Miss Eugenia Allin, B.L.S., Organizer of the Illinois Library Extension Commission, will be a frequent lecturer and other lecturers will be announced later. No university credit is given for the work as offered in 1911.

The work will occupy the whole time of the student. The number of lectures in each subject will be approximately as follows: Cataloging, 19; Classification and book numbers, 13; Book selection, 14; Administration of small libraries, 17; Reference work, 10; Work with children, 5; Loan systems, order, accession and shelf work, binding and repair, 8.

The Library courses are not offered in connection with the Summer Session, but as an independent undertaking of the Library School.

For further information address the Director of the University of Illinois Library School, Urbana, Illinois.

Explanation of Abbrevations, Etc.

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular University year. Summer courses do not always cover the same ground as those similarily numbered in the regular session. Students wishing to know in what respect such courses are similar will be gladly furnished with the desired information upon application to the Director.

The number of credit-hours that may be earned by any course is clearly indicated in every case.

The word "daily" in the announcements of courses indicates that the class meets five times each week (M.T.W.T.F.). Certain classes meet six times a week, and a few meet twice each day for five or six days.

All courses that are granted graduate credit are marked with an asterisk (*). *Courses numbered 100 and above are open only to graduate students.*

The following abbreviations are used to designate the different buildings in which classes are held:

Ag.....College of Agriculture
C..... Chemical Laboratory
E.H.....Engineering Hall
L.A.M.....Laboratory of Applied Mechanics
L.B..... Law Building
P.L..... Physical Laboratory
N.H.....Natural History Building
U. H.....University Hall
W.B..... Woman's Building

Owing to the reduction of the Summer Session term to eight weeks, the exercises of the first week will continue through Saturday. Classes scheduled for Monday will be held on Saturday. Otherwise the regular program of classes will be carried out through the first week.

OUTLINE OF COURSES

AGRICULTURE

Mr. Smith, Mr. Madden

S 1. Secondary School Agriculture.—Primarily for science teachers in high schools; a study of general agriculture adapted to secondary schools with methods of presentation; the soil, its origin, nature, functions, properties, and classification; problems of temperature, aeration, control of moisture; enrichment and impoverishment of the soil; the plant, how it feeds and grows, its modes of reproduction; factors in crop production; rotation, value and use of legumes; selection and testing of seed, their types and breeds, care and management; dairying, production of milk, testing and care of milk; farm plants, farm machinery, economics of agriculture. *Daily,* 1, 2; 118 Ag., 2½ credit-hours. Mr. Madden.

S 2. Common School Agriculture.—For teachers in elementary and rural schools; materials and methods suitable for the introduction of agriculture into the grades and the elementary schools in such ways as to lead to improved practice or to the study of professional agriculture in the higher schools. *Daily,* 10, 11; 118 Ag.; 2½ credit-hours. Mr. Madden.

S 3. History and Judging of Market and Improved Live Stock.—History, development, and characteristics of the various breeds of live-stock; effect of development of improved live-stock on agriculture and other industries; critical study of type from the standpoint of breeder, feeder, and butcher; extensive practice in judging, with especial emphasis on methods suitable for the secondary school. *Daily,* 9; 117 Ag.; 2½ credit-hours. Mr. Smith.

S-4. Beef, Pork, and Mutton Production.—A brief discussion of the principles of nutrition involved in the production of farm animals; a study of the practical system of breeding, feeding, and management of live stock; special attention given to methods of teaching in the secondary school. *Daily;* 8; 117 Ag.; 2½ credit-hours. Mr. Smith.

ART AND DESIGN

Assistant Professor LAKE, Miss HILL

S 1. ELEMENTARY.—Form drawing from still life, cast, and nature; principles of outline and shading in pencil, charcoal, and crayon; lectures on the principles of perspective. *Daily;* 9, 10; 416 U. H.; 2½ credit-hours. Assistant Professor LAKE.

S 4. WATER COLOR PAINTING.—Still-life, flowers, and out-door sketching in water color. *Daily;* 1, 2; 416 U. H.; 2½ credit-hours. Miss HILL.

Prerequisite: Art and Design 1, or equivalent skill in drawing.

S 20. ART FOR THE COMMON SCHOOLS.—The planning and execution of work in the several divisions of common school art study; design; black-board drawing. Lectures upon organization, equipment, and the administrative side of the supervisor's work. For supervisors of drawing, and public school teachers. *Daily;* 3, 4; 416 U. H.; 2½ credit-hours.

Assistant Professor LAKE and Miss HILL.

S 19. HISTORY OF THE FINE ARTS.—Illustrated lecture course with reference reading. Text: Reinach's *Apollo.* *Daily,* 11; 410 U. H.; 2½ credit-hours. Assistant Professor LAKE.

BIOLOGY

(See Botany, Zoölogy, and Entomology.)

BOTANY

Assistant Professor HOTTES, Mr. LEHENBAUER.

NOTE:—A number of informal meetings and excursions are planned to afford such students as may desire it, an opportunity for gaining facility in the use of the analytical key of the Manual, and for becoming acquainted with the local flora. No credit will be given for this work.

S 21. PLANT PHYSIOLOGY.—A study of the more important physiological processes of plants. Text: Ganong's *Plant Physiology,* 2d edition; *Daily;* 1, 2; 216 N.H.; 2½ credit-hours. Laboratory Fee $1.00.

Assistant Professor HOTTES, Mr. LEHENBAUER.

Prerequisite: Entrance credit in botany or its equivalent.

S 22. Technique and Elementary Histology.—Methods of collecting and preserving material for the classroom, and the preparation of permanent slides and museum specimens; a study of the anatomy of the vegetative organs and its relation to their function. Text: Stevens' *Plant Anatomy*, 2d edition, *Daily;* 10, 11; 204 N. H.; 2½ credit-hours. Laboratory Fee $2.00.

Assistant Professor Hottes.

Prerequisite: Botany S-21 or its equivalent.

Course for Graduates

*S 101. Cytology.—The influence of external agents on the cell; special subjects for investigation are assigned upon consultation; reports and discussions of current literature and research results. *Arrange hours and credit.* Assistant Professor Hottes.

*S 102. Physiology.—The effects of external stimuli on growth and movement; reports and discussions of recent literature and research results. *Arrange hours and credit.*

Assistant Professor Hottes.

CHEMISTRY

Assistant Professors Balke and Washburn, Dr. Derick, Dr. McCarthy, Mr. MacInnes, Mr. Strachan, Mr. Baker.

Graduate Work.—Graduate students whose major subject is not chemistry or agriculture may take for their graduate work S 5a or S 13a. Students whose major subject is chemistry may take S 111.

S 1. Elementary Chemistry.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements; the course consists of illustrated lectures, recitations, and laboratory work. Text: Alexander Smith's *General Chemistry for Colleges.* Lecture, M.W.F., 11; Quiz A, M.W.F., 10; Quiz B, T. T. S., 11; Laboratory M.T.W.T.F.S., 8, 9; 321 Chemistry Building; 5 credit-hours.

Assistant Professor Balke, Dr. McCarthy, Mr. MacInnes, Mr. Baker.

S 2. Descriptive Inorganic Chemistry.—A continuation of S 1 and is devoted mainly to the study of the metallic elements, their compounds, and properties; the course consists of illustrated lectures and recitations, but does not include laboratory work. Text:

Alexander Smith's *General Chemistry for Colleges,* M.T.W.T.F., 8; 321 Chemistry Building; 2 credit-hours.

Assistant Professor BALKE.

Prerequisite: Chemistry 1.

S 3. QUALITATIVE ANALYSIS.—Lectures, recitations, and laboratory practice in the ordinary processes of qualitative analysis, Noyes' and Smith's *Qualitative Analysis.* Lecture, T.T.S., 9; Laboratory M.T.W.T.F.S., 10, 11; 208 Chemistry Building; 3 credit-hours.

Dr. MCCARTHY.

Prerequisite: Chemistry 1.

*S 5a. ELEMENTARY QUANTITATIVE ANALYSIS.—The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods; the lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to the study of solutions. Text: Lincoln and Walton's *Exercises in Quantitative Analysis.* M.T.W.T.F., 8-12; 212 Chemistry Building; 5 credit-hours.

Mr. STRACHAN.

Prerequisite: Chemistry 1 and 3.

S 9 and 9a. ORGANIC CHEMISTRY.—A discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideration of most of the important classes of derivatives of carbon; the laboratory work of the course will consist of the preparation of typical organic compounds. Texts: Moore's *Outline of Organic Chemistry;* Noyes' *Organic Chemistry for the Laboratory;* M.T.W.T.F., 8-12; S, 8:00; 221 Chemistry Building; 5 credit-hours.

Dr. DERICK.

Prerequisite: Chemistry 2 and 3.

S 9b. ORGANIC SYNTHESIS.—Continuation of S 9a. Text: Noyes' *Organic Chemistry for the Laboratory;* M.T.W.T.F., 9, 10, 11; 221 Chemistry Building; 2 credit-hours.

Dr. DERICK.

Prerequisite: S 9a.

S 14. ORGANIC CHEMISTRY (advanced)—Lectures and recitations. Noyes' *Organic Chemistry; Daily, arrange;* 221 Chemistry Building; 3 credit-hours.

Dr. DERICK.

Prerequisite: Chemistry S-9 or equivalent.

S 11 and *S 111. RESEARCH.—Opportunity will be given for advanced work and research in inorganic, physical, organic or analytical chemistry. *Arrange.*

Assistant Professors BALKE and WASHBURN, Dr. DERICK, Dr. MCCARTHY.

(Subject to approval of Graduate School Faculty.)

*S 13a. Agricultural Analysis.—A course arranged to meet the wants of agricultural students; the work begins with the gravimetric determination and separation of the more important constituents of soils, fertilizers, and agricultural products; it includes the chemical analysis of food stuffs, such as grains, fodders, and dairy products. Text: Lincoln and Walton's *Elementary Exercises in Quantitative Analysis;* M.T.W.T.F., 8-12; 212 Chemistry Building; 5 credit-hours. Mr. Strachan.

S 17. Teachers' Course.—A study of the methods which may be followed in teaching *elementary chemistry. Arrange;* 321 Chemistry Building; 1 credit-hour. Assistant Professor Balke.

*S 102e. The Phase Rule.—A course conducted upon the seminar plan and based upon Findlay's *Phase Rule. Arrange.* 114 Chemistry Building. Assistant Professor Washburn.

GENERAL ENGINEERING DRAWING

Mr. Steward.

S 1. Elements of Drafting.—Required of all Engineering students; consists of freehand and mechanical lettering; practice in the use of instruments on standard set of working drawing plates; tracing, machine sketching, isometric and oblique projection, and perspective. Text: Miller & Steward's *Notes on Mechanical Drawing. Daily;* 8; 319 Engineering Hall; 4 credit-hours. Mr. Steward.

S 2 Descriptive Geometry.—Problems relating to the point, line, and plane; the properties of surfaces; intersections and developments of surfaces. Text: Miller's *Descriptive Geometry. Daily;* 8; 319 Engineering Hall; 4 credit-hours. Mr. Steward.

ECONOMICS

Associate Professor Bogart, Mr. Flocken.

S 2. Principles of Economics.—A survey of the general principles of Economics with special reference to the experience of the United States. Text: Seager's *Economics* (Briefer Course.) (This course will be accepted as the equivalent of Economics 2.) *Daily;* 11; 406 U. H.; 2½ credit-hours. Mr. Flocken.

Prerequisite: Two years of University Credit.

S 22. Economic History of the United States.—Beginning

with the explorations and settlements that led to the colonization of this continent the industrial development of the country is traced from the simple, isolated, agricultural communities of the colonies to the complex industrial and commercial society of today. Text: Bogart's *Economic History of the United States,* supplemented with lectures and class room discussions. (Not open to students with junior or senior standing.) *Daily,* 9; 406 U.H.; 2½ credit-hours.

Associate Professor Bogart.

S 23. Social and Industrial Problems.—A series of lectures, supplemented with outside reading and class discussions on some of the more vital problems of the day; especial attention will be given to the teaching of the subject in the schools. (This course will be accepted as a substitute for Economics 16 for students who have had Economics 2 or who are taking it concurrently. Special work will be assigned these students.) M.T.W.T., 8; 406 U.H.; 2 credit-hours. Associate Professor Bogart.

*S 118. Seminar.—Taxation in the United States and the principal European countries. Weekly Conferences. *Arrange.* 1 credit-hour. Associate Professor Bogart, Mr. Flocken.

EDUCATION AND PSYCHOLOGY

Professors Colvin and Bagley, Assistant Professors Hollister and Anderson, Principal Thomas, Mr. Kelley.

(Courses S 2, S 3, S 7, and S 101 are granted graduate credit.)

S 1. Principles of Teaching.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; a brief survey of standard methods of instruction; the leading principles of school hygiene. M.T.W.T., 2; 102 U. H.; 2 credit-hours. Professor Bagley and Mr. Kelley.

*S 2. Educational Values and Methods.—The criterion of function; classification of functions; criteria of value; an examination of the principal subjects of the school curriculum with especial reference to the relation of standard methods of organization and teaching to the principles of function and value. M.T.W.T., 3; 102 U. H.; 2 credit-hours. Professor Bagley.

*S 3. School Organization and Administration.—A general course taking for its foundation the historical background of the American public-school system; units of administration; financial support; supervision; teachers' qualifications; community adjust-

ments. Text: Dutton and Snedden's *Administration of Public Education in the United States. Daily,* 9; 102 U. H.; 2½ credit-hours. Assistant Professor HOLLISTER.

S 4. HIGH SCHOOL ADMINISTRATION.—Organization and development of the American high school; comparison with secondary schools of Europe; program of studies, its underlying principles and the means of making it effective; the school as a social group. Text: Hollister's *High School Administration. Daily,* 10; 102 U. H.; 2½ credit-hours.

S 5. CLASS MANAGEMENT.—The problems of school and class management with particular reference to high-school conditions; adolescence and its problems; discipline; lesson-planning; the recitation; relation of teacher to supervising officers and to the community. T.W.T.F., 1; 102 U.H.; 2 credit-hours. Principal THOMAS.

S 6. HISTORY OF EDUCATION.—The development of educational theory and practice in their relation to the history of civilization. Text: Anderson's *History of Common School Education. Daily,* 8; 102 U. H.; 2½ credit-hours. Assistant Professor ANDERSON.

*S 7. HISTORY OF INDUSTRIAL AND VOCATIONAL EDUCATION.—Industry and industrial training in Egypt, Greece, Rome; in the Middle Ages; the industrial revolution and its effect upon education; recent tendencies in the development of agricultural and industrial high schools, continuation schools, etc. *Daily,* 11; 203 U. H.; 2½ credit-hours. Assistant Professor ANDERSON.

S 9. EDUCATIONAL PSYCHOLOGY.—The biological aspects of learning; the analysis of the mental processes involved in learning; the economy and technique of learning; application of methods and results to the problems of the schoolroom. *Daily,* 11; 102 U.H.; 2½ credit-hours. Professor COLVIN.

S 12. THE EXPERIMENTAL PSYCHOLOGY OF THE LEARNING PROCESS.—A lecture and laboratory course in physical and mental tests to determine the abilities and defects of children as commonly met in the schools. Text: Whipple's *Manual of Mental and Physical Tests.* Lectures M.W.F., 2; laboratory, Tu., Th., 2, 3; Psychological Laboratory, U. H.; 2½ credit-hours.

Professor COLVIN and Mr. KELLEY.

S 13. EDUCATIONAL STATISTICS.—Methods of grading; kinds of averages, the mean, median, mode, average deviation, quartiles, standard deviation; forms of distribution; correlation; probable error; typical statistical studies in education; retardation and elimination. F., 2, 3; 102 U.H.; 1 credit-hour. Mr. KELLEY.

*S 101. Seminary.—Typical problems in administration and teaching. Tu., 4; 204 U.H. Professor Bagley.

ENGLISH

(See also Rhetoric)

Professor Dodge, Professor Simonds, Dr. Jones, Mr. Warnock, Mr. Tietje, Mr. Van Doren.

S 1a. Introductory Courses.—English Literature before the Nineteenth Century. This course with S 1b is equivalent to English 1 as outlined in the regular catalog. Text: Cunliffe's *Century Readings;* T.W.T.F., 10; 307 U.H.; 2 credit-hours. Professor Dodge.

Prerequisite: Three years at an approved high school.

S 1b. Introductory Course.—English Literature before the Nineteenth Century. (This course with S 1a is equivalent to English 1 as outlined in the regular catalog.) Text: Cunliffe's *Century Readings,* M.T.W.T., 2; 307 U.H.; 2 credit-hours. Mr. Van Doren.

Prerequisite: Three years at an approved high school.

S 2a. Introductory Course.—English Literature of the Nineteenth Century. This course with S 2b is equivalent to English 2 as outlined in the regular catalog. Text: Cunliffe's *Century Readings,* M.T.W.T., 1; 304 U.H.; 2 credit-hours. Mr. Warnock.

Prerequisite: Three years at an approved high school.

S 2b. Introductory Course.—English Literature of the Nineteenth Century. (This course with S 2a is equivalent to English 2 as outlined in the University catalog.) Text, Cunliffe's *Century Readings,* M.T.W.T., 2; 304 U.H.; 2 credit-hours. Mr. Tietje.

Prerequisite: Three years at an approved high school.

S 15. Course for Teachers.—Some of the books in English Literature required for entrance to the University are studied with reference to their use in the school room. M.T.W.T., 11; 307 U.H.; 2 credit-hours. Professor Simonds.

Prerequisite: The consent of the instructor.

S 16. American Literature. Texts: Cavins's *Early American Writers* and Page's *Chief American Poets.* M.T.W.T., 10; 321 U.H.; 2 credit hours. Professor Simonds.

Prerequisite: English 1 and 2 or an equivalent.

S 23. Elementary Course in Shakespeare.—Text: Neilson's *The Complete Works of William Shakespeare,* M.T.W.F., 1; 307 U.H.; 2 credit-hours. Dr. Jones.

Prerequisite: English 1 and 2 or an equivalent.

S 7. Chancer, Text: Skeat's *Student's Chancer.* M.T.W.T., 3; 307 U.H.; 2 credit-hours. Dr. Jones.

Prerequisite: Two years of college English.

S 8. Old English (Anglo-Saxon). Grammar, prose and short poems. Text: Smith's *An Old English Grammar and Exercise Book,* M.T.W.T.F.S., 9; 307 U.H.; 3 credit-hours.

Professor Dodge.

Prerequisite: Two years of college English, or one year of college English and one year of German.

ENTOMOLOGY

Assistant Professor Folsom, Mr. Glasgow.

S 1. General Field and Laboratory Course.—Planned to meet the needs of high school teachers; the most essential facts of entomology, especially those relating to insects that affect the agriculture of the State; lectures, laboratory studies, and field observations. (For agricultural students, arrangements are made to enable them to carry under this course the required economic entomology [Entomology 4] of the fall and spring semesters.) Text: Folsom's *Entomology with Reference to Its Biological and Economic Aspects. Daily,* 1, 2; 408 N.H.; 2½ credit-hours.

Assistant Professor Folsom.

S 2. Advanced Course.—Instruction in several lines of advanced entomological study to meet the purposes of the individual student; a special series of lectures will be given to those who avail themselves of the opportunity that the summer season affords for the study of advanced economic entomology. *Arrange.*

Assistant Professor Folsom.

FRENCH

(See Romance Languages)

GERMAN

Dr. Poor, Mr. DeVries, Mr. Koller, Mr. Barto

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easy texts. Text: Vos's *Essentials of German.* Section A, M., 9, T.W.T.F., 8, 9; 312 U.H.; section B, M., 11, T.W.T.F., 10, 11; 310 U.H.; 4 credit-hours.

Dr. Poor, Mr. Koller.

S 2. Intermediate Course.—Grammar, composition, reading.

(Open to those who have had German 1 of the regular University year or an equivalent.) Text: Vos's *Essentials of German;* M.T.W.T.F.S., 8; 202 U.H.; 3 credit-hours. Mr. Barto.

S 3. Prose Reading.—Reading of narrative prose, sight translation, composition. (Open to those who have had German 3 of the regular University year or an equivalent.) M.T.W.T.F.S., 9; 202 U.H.; 3 credit-hours. Mr. Barto.

S 4. Readings from the Classics.—Lessing's *Minna von Barnhelm,* Schiller's *Jungfrau von Orleans.* (Open to those who have had German 4 in the regular University year or an equivalent.) M.T.W.T.F.S., 9; 311 U.H.; 3 credit-hours. Mr. DeVries.

Note: Students securing a grade of 85 or more and doing additional work assigned by the instructor, may supplement the work of S 2, S 3, or S 4, making it the equivalent of the University courses 3, 4, or 5 respectively, the additional credit to be indicated at registration.

S 5. Prose Composition.—Translation of ordinary prose into German; study of idiomatic constructions; practice in free composition in German. (Open to those who have had two years of University German or an equivalent.) Text: Pope's *German Composition.* T.W.T.F., 9; 310 U.H.; 2 credit-hours. Mr. Koller.

S 7. Readings from Goethe and Schiller.—Goethe's *Iphigenie auf Tauris,* Schiller's *Braut von Messina,* and selected lyrics and ballads. (Open to those who have had two years of University German or an equivalent.) M.T.W.T.F.S., 8; 311 U.H.; 3 credit-hours. Mr. DeVries.

S 9. Teachers' Course.—Place, aim, and scope of the study of German in the high school; discussion of methods and the chief difficulties in teaching German. (Open to those who have taught German or to those who have had three years of University German or an equivalent. T.T., 10; 312 U.H.; 1 credit-hour. Dr. Poor.

S 11. Goethe's Faust.—Critical reading of the first part of Faust. (Open to those who have had three years of University German or an equivalent.) M.W.F., 10; 312 U.H.; 1½ credit-hours. Dr. Poor.

HISTORY

Professor Greene, Professor Garner, Professor Anderson.

S 1c. European History, 1648-1871.—An introductory course corresponding, for the period covered, to History 1, as given during the regular University session. (It is the plan of the department to

cover the field of medieval and modern European history in three courses in succeeding summer sessions. The course given next year will probably cover the early medieval period.) *Daily,* 10; 408 U.H.; 2½ credit-hours. Professor Anderson.

S 3a. American History, 1606-1783.—A part of the usual introductory course in American history which will ordinarily be given in three periods in succeeding sessions. (The course offered next year will probably cover the period from 1783-1860.) *Daily,* 8; 408 U.H.; 2½ credit-hours. Professor Greene.

Courses for Graduates and Advanced Undergraduates
(Junior or senior standing required)

S 15. The American Civil War and the Period of Reconstruction, 1860-1877. *Daily,* 9; 408 U.H.; 2½ credit-hours. Professor Garner.

Prerequisite: One college course in American history or its equivalent.

S 24. Europe During the Napoleonic Period, 1799-1815.—Special attention to the work of Napoleon in the reorganization of French institutions and in the extension of the social transformations of the French Revolution to the other countries of Europe; critical examination of organic laws, treaties, and other state papers. *Daily,* 11; 408 U.H.; 2½ credit-hours. Professor Anderson.

Prerequisite: One college course in modern European history or its equivalent.

Courses for Graduates

*S 112. Selected Topics in American History during the Eighteenth Century.—Provision will be made in this course for graduate students who desire guidance either in reading or in research. *Arrange.* Professor Greene.

Prerequisite: This course is open only to students regularly registered in the Graduate School, who have had at least one college course in American history.

HOUSEHOLD SCIENCE

Miss Dickinson, Miss Pincomb.

Note: The work offered in food is of two grades. A, that designed for those who have had no previous work of the kind; B,

that designed for those who have had training in general science, who have studied or taught household science and who wish to prepare themselves to teach it in high schools. The text book used *is Selection and Preparation of Food.* There will be reference work in addition.

S 1A. Food.—This course includes the use and care of utensils and kitchen equipment, the cooking of various types of food, combinations, cost and sources of food, table setting and service. Lecture M., 8; Laboratory Tu.Th., 8, 9; Recitation W., 8; Table Setting F., 8; Woman's Building; 1 credit-hour. Miss Pincomb.

S 1B. Food.—This work will include a brief review of the types of foods, a study of food combinations with consideration of cost and methods of estimating dietetic value; planning and serving of typical meals. Laboratory M.W.F., 8,9; Lecture Tu. 8; Discussion Th., 8; Woman's Building; 1½ credit-hours. Miss Pincomb.

S 1. Sewing.—The making of undergarments, the use and care of machines, drafting, use of patterns, making of a shirt waist and cotton dress. Laboratory M.W.F., 10, 11; Lecture Tu., 11; Quiz Th. 11; Woman's Building; 1½ credit hours. Miss Dickinson.

3. Organization and Equipment.—Work in both domestic science and domestic art considered from the standpoint of their relation to other subjects in the school curriculum; kind and cost of equipment and methods of presentation. Tu. Th., 9; Woman's Building; 1 credit-hour. Miss Dickinson.

LATIN

Dr. Canter

S 1. Roman Elegy.—Tibullus, Propertius, and Ovid will be read, with due attention to the differences in their social, political, and literary ideals and their use of the elegiac distich. M.W.F., 8; 320 U.H.; 1½ credit-hours. Dr. Canter.

*S 102. Roman Epigram.—Catullus and Martial will form the center of the work; Lectures and discussions on the origin and development of the epigram as a department of literature; its technique and chief representatives in Roman soil from Ennius to the writers of the Anthologia Latina. M.W.F., 9; 320 U.H. 1½ credit-hours. Dr. Canter.

S 3. Sallust.—Selections from the Catiline and Jugurtha with a study of Sallust's syntax and style as compared with that of Cicero. T. Th., 8; 320 U. H.; 1 credit-hour. Dr. Canter.

S 4. Teachers' Course.—Special attention to the problems and methods of instruction in Latin in the secondary schools; the essentials of Latin study in the first and second years; books and equipment. T.Th., 9; 320 U.H.; 1 credit-hour. Dr. Canter.

MANUAL TRAINING

(See also Mechanical Engineering)

Mr. Wahlstrom, Mr. Ellis

S 1. Organization of Manual Training.—The development of manual training; manual training systems; manual training courses in the United States; the influence of industrial education; manual training aims, methods, and limitations; study of courses; planning equipments. *Daily,* 8; Lecture Room, E.H.; 2½ credit-hours. Mr. Wahlstrom.

S 2. Methods of Teaching Wood-Working.—Constructive design in wood-working; fundamental processes; methods of conducting classes; practice-teaching; planning courses in bench-work in wood; consideration of courses in thin wood, wood-turning, and framing. Texts: Griffith's *Essentials of Wood Working;* Crawshaw's *Problems in Furniture Making. Daily,* 9, 10, 11; Wood Shop; 3 credit-hours. Mr. Wahlstrom and Mr. Ellis.

MATHEMATICS

Assistant Professor Shaw, Dr. Crathorne, Dr. Wahlin, Mr. Minnick, Mr. Carscallen

S 2. Advanced Algebra.—(Equivalent to the course offered in the University on the same subject). Algebraic reductions; variables and functions; equations; inequalities; mathematical induction; variation; progressions; complex numbers; limits; infinite series; undetermined coefficients. (Theory of equations will be given with Math. S 6.) Text: Rietz and Crathorne's *College Algebra.* M.T.W.T.F.S., 425 N.H.; 3 credit-hours. Dr. Crathorne.

S 4. Plane Trigonometry.—(Equivalent to Mathematics 4.) Math. 4. Text: Hall and Frink's *Plane Trigonometry.* M.T.W.T.F., 9; 425 N.H.; 2 credit-hours. Mr. Carscallen.

S 6. Analytical Geometry.—(Equivalent to Mathematics 6.) An introductory course in plane and solid analytic geometry; the

theory of equations is developed in this course along with the study of the corresponding graphs. Text: Riggs' *Analytic Geometry.* M.T.W.T.F., 10, 11; 418 N.H.; 5 credit-hours. Mr. MINNICK.

S 7. DIFFERENTIAL CALCULUS.—(Equivalent to Mathematics 7.) Text: Townsend and Goodenough's *First Course in Calculus.* M.T.W.T.F., 8, 9; 431 N.H.; 5 credit-hours. Dr. WAHLIN.

S 9. INTEGRAL CALCULUS.—(Equivalent to Mathematics 9.) Two sections. Text: Townsend and Goodenough's *First Course in Calculus.* M.T.W.T.F.S., 8; 419 N.H.; 3 credit-hours. Mr. CARSCALLEN. M.T.W.T.F.S., 9; 418 N. H.; 3 credit-hours.

Assistant Professor SHAW.

*S 11. SYNOPTIC COURSE.—(Equivalent to Mathematics 11.) Development of Mathematics; importance in the intellectual history of the race; principles of the important branches of pure and applied mathematics; survey of modern extensions. Lectures and assigned readings. M.T.W.T.F.S., 11; 435 N.H.

Assistant Professor SHAW.

*S 12. THEORY OF EQUATIONS.—Continuation of Mathematics 2. Properties of the roots of equations; symmetric functions; Sturm's and other like theorems; determinants. Text: Burnside and Panton Vol. I. M.T.W.T.F.S., 9; 435 N.H. Dr. CRATHORNE.

MECHANICAL ENGINEERING

(SEE ALSO MANUAL TRAINING)

Mr. ELLIS, Mr. LANHAM, Mr. SCROGGIN

S 1. PATTERN SHOP.—The care and use of tools; the construction of patterns, core boxes, and the use of machines such as are found in modern pattern shops. *Daily,* 9, 10, 11; Wood Shop; 3 credit-hours. Mr. ELLIS.

S 2. FORGE SHOP.—Shaping and welding iron and steel; dressing and tempering lathe and other tools; annealing and case hardening. M.T.W., 2, 3; Tu. Th., 2, 3, 4; Forge Shop; 1½ credit hours. Mr. LANHAM.

S 3. MACHINE SHOP.—Chipping and filing; elementary work on lathe, drill press, shaper, planer, and grinding machine. *Daily,* 2, 3, 4; Machine Shop; 2½ credit-hours. Mr. SCROGGIN.

S 4. ADVANCED MACHINE SHOP.—The use of milling machine, screw machine, gear cutter, boring mill and turret lathe; erecting

and testing of machines and gas engines. *Daily, 2, 3, 4*; Machine Shop. 2½ credit-hours. Mr. Scroggin.

Note: Lectures on tools and shop processes are given frequently, and inspection trips to shops in the local and adjoining towns are made in connection with all classes in shop practice. A student may finish one full year's work in the shop during the summer term.

MECHANICS, THEORETICAL AND APPLIED

Mr. Seely, Mr. Noerenberg, Mr. Enger.

S 7. Analytical Mechanics.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics. Daily, 9, 11*; 202 E.H.; 3 credit-hours. Mr. Noerenberg.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 8. Analytical Mechanics.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics. Daily,* 10; 202 E.H.; 2½ credit-hours. Mr. Seeley.

Prerequisite: Mathematics 9 and T. & A. M. 7.

S 9. Resistance of Materials.—Training in the elementary principles of the mechanics of materials, with experiments and investigations in the materials laboratory to verify the experimental laws; problems in ordinary engineering practice to train the student in the use of his knowledge. This course covers the same ground both in text-book, problem work, and in experiments in the materials testing laboratory as T. and A. M. 9. Merriman's *Mechanics of Materials. Daily,* 11; 202 E.H.; M. W., 8, 9; L.A.M.; 3½ credit-hours. Mr. Seely, Mr. Enger.

Prerequisite: T. and A. M. 7 and registration in T. and A. M. 8.

S 10. Hydraulics.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observation and measurement of pressure, velocity, and flow, in power and efficiency, and in the determination of experimental coefficients. Hoskin's *Hydraulics.* M.T.W.T., 1; 202 L.A.M.; T.T., 8, 9; Hyd. Lab.; 3 credit-hours. Mr. Enger.

Prerequisite: T. and A. M., 8.

Note: With the opening of the hydraulic laboratory for the Summer school, arrangements may be made to use its facilities for special experimental work.

MUSIC

Mrs. Smith

S 1. Public School Music.—Thorough and comprehensive instruction in ear-training, sight-singing, and methods of instruction; particularly adapted to the needs of elementary and high-school teachers, and supervisors of music; superintendents and principals will have excellent opportunities for observing methods of teaching music. Section A, primary and intermediate, M.W., 9; 126 U.H. Section B, high-school appreciation course, Tu. Th., 9; 126 U.H. Mrs. Smith.

S 2. Ear-Training.—Training in recognition of rhythms, intervals, and chords; the fundamental principles of musical notation; some work in musical forms and analysis. (A part of the work in ear-training will be given in connection with S 3). W., 8; 117 U.H. Mrs. Smith.

S 3. Sight-Singing.—Visualization (eye-training); the fundamental principles of voice-culture; correct breathing; dictation, oral and written; songs and their elements. Section A, preparatory ear-training and sight-singing, M.Th., 8; 126 U.H. Section B, advanced ear-training and sight-singing, Tu, F., 8; 126 U.H. Mrs. Smith.

S 4. Chorus Work.—M.W., 4; 126 U.H. Mrs. Smith.

Note: University credit is not given for courses in music. Private lessons in voice, piano, violin, band instruments, and musical theory are offered by the instructors in the School of Music. Students interested in such lessons should communicate with Director C. H. Mills of the School of Music.

PHILOSOPHY

Professor Daniels.

*S 4. Modern Philosophy.—The formation and development of the problems and conceptions in philosophy from Descartes to the present time. Selections from the philosophical masterpieces of this period. M.T.W.T.F., 3; 203 U.H.; 2½ credit-hours. Professor Daniels.

S 9. Political and Social Ethics.—A study of moral principles in their application to political and social relations. M.T.W.T.F., 2; 203 U.H.; 2½ credit-hours. Professor Daniels.

PHYSICAL TRAINING FOR MEN

Director Hana, Mr. Fargo

S 1. Gymnasium Practice.—Class drills with hand apparatus in conjunction with heavy apparatus work. *Arrange.* Mr. Hana.

S 2. Gymnasium Practice.—Advanced heavy apparatus work. *Arrange.* Mr. Hana

S 3. Swimming.—The large pool offers ample facilities for swimming, and instruction will be given in all branches of the art. Special attention will be given beginners. *Arrange.* Mr. Fargo.

PHYSICAL TRAINING FOR WOMEN

Mrs. Hatch, Miss Nuckolls, Miss Gaut.

S 1. Physical Training.—A study of personal hygiene, and the relation hygiene and exercise bear to health. Lectures and practice. M.T.W.T.F., 3; Woman's Gymnasium.

S 2. Physical Training.—Practice in free gymnastics, light apparatus, folk and gymnastic dancing, tennis and other games. M.T.W.T.F., 4; Woman's Gymnasium.

S 3. Swimming.—Instruction and practice. M.T.W.T.F., 10, 11, 2, 3, 4; Woman's Gymnasium.

PHYSICS

Assistant Professor Watson, Mr. Taylor, Mr. Williams, Mr. Woodrow.

S 2a. General Physics.—Lectures with experimental demonstrations and recitations. The topics for 1911 will be electricity and magnetism. Text: Thompson's *Elementary Lessons in Electricity and Magnetism.* M.W.F., 9; Lecture Room B, Physics Building. 1½ credit-hours. Dr. Taylor, Mr. Woodrow.

Prerequisites: Plane geometry and high school algebra. Plane trigonometry desired.

S 2b. Introductory Laboratory Physics.—A laboratory course in electricity and magnetism to accompany S 2a. Text: Taylor's *Laboratory Physics,* M.W.F., 2, 3; 212 Physics Building; 1½ credit-hours. Dr. Taylor, Mr. Woodrow.

Prerequisites: Same as for S 2a.

S 15. Electricity and Magnetism.—A laboratory course with lectures, assigned reading, and reports. Text: Carhart and Pat-

terson *Electricity and Magnetism.* M.W.F., 1-4; 112 Physics Building; 1½ credit-hours. Dr. Williams.

Prerequisite: A course in general physics.

S 16. Heat.—Lectures and recitations on fundamental heat phenomena, accompanied by laboratory experiments in thermometry, calorimetry, vapor pressure, expansion, etc. Text: Edser's *Heat.* Tu. Th., 1-4; Physics Building; 1 credit-hour. Dr. Williams.

Prerequisite: A course in general physics.

S 18. Teachers' Course.—Discussions of the practical problems involved in teaching elementary physics; methods of teaching; the lecture, the laboratory, the quiz, the note-book; the text book; apparatus and purchasing of apparatus; literature for physics. Text: Notes by the instructor. M.W.F., 8; 208 Physics Building; 1½ credit-hours. Assistant Professor Watson.

Prerequisite: A course in general physics, or teaching experience in physics.

S 23. Wave Motion and Sound.—An elementary presentation of wave motion with applications to sound. Text: Everett's *Vibratory Motion and Sound.* Tu.Th., 8; 208 Physics Building; 1 credit-hour. Assistant Professor Watson.

Prerequisite: Algebra and trigonometry, a course in general physics desired.

S 24a. Radioactivity.—A course of lectures on the properties of radioactive substances, including the relation of these substances to each other, and the nature and properties of their respective radiations. References: Rutherford's *Radioactivity,* Makower's *Radioactive Substances,* and current literature. M.W.F, 10; 208 Physics Building; 1½ credit-hours. Dr. Taylor.

Prerequisite: A course in general physics.

*S 24b. Radioactivity.—A laboratory course of experiments in which the student actually observes the nature and properties of the radiations given out by radioactive substances that are discussed in S 24a. Whenever possible this course should be taken in conjunction with S 24a. Text: McClung's *Conduction of Electricity through Gases and Radioactivity.* Tu.Th., 9, 10; Physics Building; 1 credit-hour. Dr. Taylor.

Prerequisite: See Instructor.

*S 4. Advanced Electrical and Magnetic Measurements.—Laboratory exercises with discussions and recitations. Text: Carhart and Patterson *Electricity and Magnetism.* M.W.F., 1-4; 112 Physics Building; 1½ credit-hours. Dr. Williams.

Prerequisite: A course in general physics and calculus.

*S 31. Investigation of Special Problems.—An advanced course in the physical laboratory. A problem is chosen and worked out with the advice and direction of the instructor. This course may be counted for graduate credit. *Arrange.*

Assistant Professor Watson, Dr. Taylor, Dr. Williams.

*S 33. Seminary and Thesis.—This course is primarily for graduate students. *Arrange.*

Assistant Professor Watson, Dr. Taylor, Dr. Williams.

PHYSIOGRAPHY.

S 1. Course for Teachers.—A study of physiographic forces and the common topographic forms which they have produced; designed especially for those who are teaching in the secondary schools; field trips and laboratory work are conducted with special attention to the needs of teachers. Laboratory Fee $1. Text: Salisbury's *Advanced Physiography.* Lecture, 249, N.H., M.W.F., 1; Laboratory Tu. 1, 2; Field work Th., 1-5; S., 9-12; 4 credit hours.

Mr. Hutton.

S 2. Physiography of the United States.—The development of the principal psysiographic regions of the United States and the influence of the stage of physiographic development upon the inhabitants. Laboratory Fee $1. Lecture, 249, N.H., M.W.F., 10; Laboratory, Tu., Th., 10, 11; 2½ credit-hours. Mr. Hutton.

Prerequisite: An elementary course in Physiography.

POLITICAL SCIENCE

Professor Garner

S 1. American State Government.—The place of the state in the American federal system; constitutional rights and obligations of the states; distribution of powers between the states and the national government; state constitutions; the formation of states and methods of admission to the Union; the organization of state government; the executive, legislative and judiciary; administration of state institutions. *Daily,* 402 U.H.; 2½ credit-hours.

Professor Garner.

RHETORIC

(See also English)

Mr. Halliday, Mr. Warnock, Mr. Tietje, Mr. Van Doren

S 1a. Rhetoric and Themes.—(This course is the same as the first semester of Rhetoric 1, as outlined in the regular catalog.)

Text: Scott and Denney's *Paragraph-Writing. Two sections.* M.T.W.T.F.S., 11; 303 U.H.; 3 credit-hours. Mr. TIETJE.
M.T.W.T.F.S., 3; 302 U.H.; 3 credit-hours. Mr. VAN DOREN.

Prerequisite: Three years at an approved high school.

S 1b. RHETORIC AND THEMES.—(This course is the same as the second semester of Rhetoric 1, as outlined in the regular catalog.) Text: Scott and Denney's *Paragraph-Writing.* M.T.W.T.F.S., 2; 303 University Hall; 3 credit-hours. Mr. WARNOCK.

Prerequisite: Rhetoric 1 or an equivalent.

S 4. THE ART OF DEBATE.—Brief writing and extemporaneous presentation of argument in formal debate. Text: Foster's *Argumentation and Debating.* T.T., 9; Court-room, L.B.; 1 credit-hour. Mr. HALLIDAY.

Prerequisite: Rhetoric 1 and 7.

S 5. EXTEMPORE SPEAKING.—Platform discussion of current events, practice in after-dinner speaking, impromptu debates, etc. Text: Phillips's *Effective Speaking.* T.T., 11; Court-room, L.B.; 1 credit-hour. Mr. HALLIDAY.

Prerequisite: Rhetoric 1.

S 7. PUBLIC SPEAKING.—Vocal, breathing, action, and declamation exercises, supplemented by text-book and individual instruction. Text: Phillips's *Natural Drills in Expression.* M.T.W.T., 8; Court-room, L.B.; 1 credit-hour. Mr. HALLIDAY

Prerequisite: Three years at an approved high school.

ROMANCE LANGUAGES

FRENCH

Associate Professor CARNAHAN, Mr. HENDRIX

S 1. BEGINNERS' COURSE.—Pronunciation, grammar, composition, reading of easy texts. Texts: Fraser and Squair's *Elementary French Grammar;* Bacon's *Une Semaine à Paris.* M., 9; T.W.T.F., 8, 9; 208 U.H.; 4 credit-hours. Associate Professor CARNAHAN.

S 2. READING OF MODERN FRENCH.—Rapid reading of modern authors, composition, conversation; for students who have had French 1 of the regular University year, or its equivalent. Texts: *Everyday French,* Bronson; *Colomba,* Mérimée; *Pêcheur d'Islande,* Loti; *La Mare au Diable,* George Sand; *Bataille de Dames,* Scribe et Legouvé; *Mademoiselle de la Seiglière,* Sandeau. *Daily,* 10; 207 U.H.; 2 credit-hours or more by arrangement at registration. Mr. HENDRIX.

S 4. Advanced Composition and Conversation.—Open to students who have had two years of University French, or an equivalent. M.W., 10; 209 U.H.; 1 credit-hour.

Associate Professor Carnahan.

*S 10. History of French Literature.—A rapid survey of the field of French literature. Lectures with collateral reading; open to students who have had two years of University French, or an equivalent. Text: Kastner and Atkins' *History of French Literature.* T.T., 10; 209 U.H.; 1 credit-hour, or more by arrangement at registration. Associate Professor Carnahan.

*S 125. Seminar.—Graduate work in the Romance languages. *Arrange.* Associate Professor Carnahan.

SPANISH

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easy texts. Text: Giese's *First Spanish Book and Reader.* M., 9; T.W.T.F., 8, 9; 207 U.H.; 4 credit-hours.

Mr. Hendrix.

SOCIOLOGY

Professor Hayes

*S 1. Principles of Sociology.—The general principles involved in the interpretation of the life of a people, including their customs and institutions, the development of individuality in society, illustrative application of principles discussed to practical problems in American life. Text: Elwood's *Sociology and Modern Social Problems.* M.T.W.T.F., 3; 402 U.H.; 2½ credit-hours.

Professor Hayes.

S 5. Charities and Corrections.—The causes, prevention, and treatment of poverty and crime. M.T.W.T.F., 2; 402 U.H.; 2½ credit-hours. Professor Hayes.

ZOOLOGY

Professor Galloway, Mr. La Rue

S 1. Elementary General Zoology.—General morphology, physiology, ecology, economic relations, etc.; suited to the needs of the general student and of teachers in secondary schools. Laboratory

fee, $2.00. Text: Galloway's *Text Book of Zoology*. M.W.F., 9; Laboratory five times a week, 10-12; 312 N.H.; 4 credit-hours.

Professor GALLOWAY.

S 19. TEACHERS' COURSE.—Lectures, discussions, and reports; the position of zoology in the educational scheme; methods of teaching; the selection and pedagogical use of zoological materials in different grades of teaching. Open to all interested with or without the preceding course (Zool. S 1). T.T., 9; 229 N.H.; 1 credit-hour.

Professor GALLOWAY.

S 27. MICROSCOPICAL TECHNIQUE.—Approved methods of preserving and mounting different animals for microscopical study; talks and discussions; especial attention will be given to the choice of methods which can be used to advantage in laboratories with only a moderate equipment; actual practice in narcotization, killing, fixing, hardening, clearing, infiltrating, embedding in paraffine or celloidin, sectioning, and staining; methods for making both temporary and permanent preparations. The student will make many preparations which will be of subsequent value for study or teaching. Open to those who have had no previous training in microscopical technique but have had at least one semester in botany or zoölogy. The course can be adapted to special needs of individual students and those who wish to pursue advanced work should register beforehand in order that their needs may be met. Laboratory fee, $2.00. *Daily*, 1-3; 312 N.H.; 3 credit-hours. Mr. LA RUE.

University of Illinois Location

The University of Illinois is situated in Champaign Country in the eastern central part of the State between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis Railroads. The cities of Urbana and Champaign have together a population of 20,000.

The institution was incorporated February 28, 1867, under the name, The Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments

embraces about two hundred and twenty acres, besides a farm of four hundred acres. The buildings at Urbana are twenty-three in number, and consist of the Agricultural Building, the Agronomy Building, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the Library, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, the Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop and Foundry. The Physics Building and a large addition to the Natural History Building were completed last year.

Libraries

The general University library, the library of the State Laboratory of Natural History, that of the Agricultural Experiment Station, and that of the College of Law are all at the University in Urbana.

The general University library, including the Agricultural Experiment Station library, contains 166,000 volumes and pamphlets. The reading room contains over 3,100 bound volumes of periodicals. The University has a subscription list of 1,112 periodicals, the current numbers of which are kept in the east-tower reading room. The library of the State Laboratory of Natural History contains 6,060 volumes and 16,440 pamphlets. The Library of the College of Law contains the Federal and State Reports, the leading text-books, and the leading periodicals. The School of Education has made a special collection of about 3,000 pamphlets, which are kept in the rooms of the School in University Hall.

Athletics

Although both the men's and women's gymnasium will be used in some parts for the regular class work in Physical Training, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums are new and well equipped. Each contains swimming pool, shower, and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis

courts upon the University campus are open to the student body. The general athletic fields will be open to the students. The golf links, which are in the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, baseball clubs, etc.

Boarding and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board can be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or,

W. C. Bagley, Director,
Room 217, University Hall,
Urbana, Illinois.

The University of Illinois

Summer Session

June 16 to August 8, 1913

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UNIVERSITY OF ILLINOIS

Edmund Janes James, Ph.D., LL.D., President of the University.

William Chandler Bagley, Ph.D., Director of the School of Education; *Director of the Summer Session.* (Office, Room 203, University Hall.)

George F. Frazier, Comptroller.

Charles Maxwell McConn, A.M., Registrar and Secretary. (Office, Natural History Building.)

CALENDAR

SUMMER SESSION

June 16, 1913, Monday	Registration Day
August 7 and 8, Thursday and Friday	Final Examinations

FIRST SEMESTER

September 15 to 18, Monday to Thursday	Entrance Examination
September 22 and 23, Monday and Tuesday	Registration Days
September 24, Wednesday, 8 A. M.	Instruction Begins

REGISTRATION OF STUDENTS

'94-'95	810
'95-'96	855
'96-'97	1075
'97-'98	1585
'98-'99	1825
'99-'00	2234
'00-'01	2505
'01-'02	2950
'02-'03	3288
'03-'04	3594
'04-'05	3729
'05-'06	4070
'06-'07	4316
'07-'08	4743
'08-'09	4977
'09-'10	5118
'10-'11	5217
'11-'12	5200
'12-'13 to April 1	5079

STAFF OF INSTRUCTION

SUMMER SESSION, 1913

Adams, John, Professor of Education, University of London.
Anderson, Lewis Flint, Ph.D., Assistant Professor of Education.
Ayres, Leonard P., Ph.D., Russell Sage Foundation, New York City.
Bagley, William Chandler, Ph.D., Professor of Education.
Balke, Clarence William, Ph.D., Assistant Professor of Inorganic Chemistry.
Barto, Daniel O., B.S., Associate in Poultry Husbandry.
Barto, Philip Stephan, A.M., Assistant in German.
Barton, Herbert Jewett, A.M., Professor of Latin Language and Literature.
Bauer, Frederick Charles, B.S., Instructor in Soil Fertility.
Bell, James Edgar, B.S., Assistant in Chemistry.
Biester, Alice, A.B., Assistant in Household Science.
Bole, Simeon James, A.M., Instructor in Pomology and Assistant in Plant Breeding.
Börger, Robert Lacy, Ph.D., Associate in Mathematics.
Buchen, Walter Albert, A.B., Assistant in English.
Carnahan, David Hobart, Ph.D., Associate Professor of the Romance Languages.
Carpenter, Frederick Walton, Ph.D., Assistant Professor of Zoology.
Carscallen, George Ernest, A. M., Assistant in Mathematics.
Coffman, Lotus Delta, Ph.D., Professor of Education.
Cole, Arthur Charles, Ph.D., Instructor in History.
Cort, William Walter, A.M., Instructor in Biology at Colorado College.
Coyle, James P., A.B., Assistant in Physics.
Crathorne, Arthur Robert, Ph.D., Associate in Mathematics.
Derick, Clarence George, Ph.D., Associate in Chemistry.
Dodge, Daniel Kilham, Ph.D., Professor of the English Language and Literature.
Dowrie, George William, A.M., Assistant in Economics.
Durst, Charles E., B.S., Assistant in Olericulture.
Ellis, Frederick, Instructor in Wood Working.

Ensign, Newton Edward, A.B., B.S., Instructor in Theoretical and Applied Mechanics.

Farwell, Stanley Prince, M.S., Instructor in Theoretical and Applied Mechanics.

Fleming, Georgia, B.S., Assistant in Household Science.

Folsom, Justus Watson, D.Sc., Assistant Professor of Entomology.

Ford, Guy Stanton, Ph.D., Professor of Modern European History.

Gettell, Raymond Garfield, Ph.D., Professor of Political Science, Trinity College, Hartford, Conn.

Halliday, Ernest Milton, A.B., L.L.B., Associate in English.

Hayes, Edward Cary, Ph.D., Professor of Sociology.

Held, Felix Emil, A.M., Assistant in German.

Hill, Mary, Assistant in Art and Design.

Hopkins, B. Smith, Ph.D., Instructor in Chemistry.

Hottes, Charles Frederick, Ph.D., Assistant Professor of Botany.

Jones, Harrie Stuart Vedder, Ph.D., Assistant Professor of English.

Jones, Lloyd Theodore, A.M., Assistant in Physics.

Kamm, Oliver, B.S., Assistant in Chemistry.

Koller, Armin Hajman, Ph.D., Instructor in German.

Lehenbauer, Philip Augustus, A.M., Assistant in Botany.

Lessing Otto Edward, Ph.D., Associate Professor of German.

Liddell, Mark H., formerly Professor of English, University of Texas.

Lillehei, Ingebright L., A.M., Assistant in the Romance Languages.

Manley, Edwin John, Instructor in Swimming.

Martin, Oscar Ross, A.B., Assistant in Economics.

Miller, Wilford Stanton, A.M., Assistant in Education and Secretary of the School of Education.

Mills, Charles Henry, D. of Mus., F. R. C. O., Professor of Music.

Noerenberg, Clarence Eugene, A.B., A.E., Instructor in Theoretical and Applied Mechanics.

Nolan, Aretas Wilbur, A.B., M.S., Assistant Professor of Agricultural Extension.

Oldfather, William Abbott, Ph.D., Associate Professor of Classics.

Park, Joseph C., Director of Industrial Education, Oswego, New York.

Parsons, Maud, A.B., Assistant in Household Science and Director of Lunch Room.

Paul, Harry G., Ph.D., Assistant Professor of English and Literature.

Peterson, Alvah, B.S., Assistant in Entomology.

Randolph, Oscar Alan, B.S., Assistant in Physics.

Robinson, Maurice Henry, Ph.D., Professor of Industry and Transportation.

Rowland, Sidney Archie, A.B., Assistant in Mathematics.

Rugg, Harold Ordway, B.S., C.E., Instructor in General Engineering Drawing.

Rutledge, George, A.B., Research Assistant in Mathematics.

Scroggin, David Leonard, Instructor in Machine Shop Practice.

Sears, George Wallace, M.S., Assistant in Chemistry.

Smith, William Herschel, M.S., Instructor in Animal Husbandry.

Strachan, Earle Kenneth, Ph.D., Instructor in Chemistry.

Tieje, Arthur Jerrold, Ph.D., Instructor in English.

Warner, Earle Horace, A.B., Assistant in Phyhics.

Weber, Henry C. P., Ph.D., Associate in Chemistry.

Williams, Elmer Howard, Ph.D., Associate in Physics.

————, Instructor in Ornithology.

GENERAL STATEMENT

The Summer Session of the University of Illinois for 1913 will open on June 16, and close on August 8, making a term of *eight weeks*. The opening day will be devoted to registration. The final examinations will be held on Thursday and Friday of the last week.

All of the courses will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Session a certificate of such attendance, but university credit will not be given for six-weeks courses.

The number of credit-hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight credit-hours or less.

Purpose

The primary purpose of the Summer Session is to meet the needs of teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. The greater number of courses offered are designed particularly for high-school teachers, supervising officers, and teachers of special subjects (art, music, manual training, domestic science, agriculture, etc.) and for college instructors, school supervisors, and principals who are working for advanced degrees. At the same time, students who may not fall within these groups are welcomed at the Session, and several courses of a more general nature are provided to meet their needs.

Fees

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee is charged in some courses for materials used. Any single course may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken. A single course is understood to mean not more than two and one-half credit-hours.

Scholarships

By ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must either pass the entrance examinations, or present a certificate from an accredited high school or other evidence of having completed the requisite amount of preparatory work.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class 1913, and to persons (otherwise qualified) who have not been teachers, but who are under contract to teach in the State during the coming year.

Those who wish to take advantage of the scholarship privilege should present to the Director of the Session prior to June 1, 1913, a statement from the board of education employing them to the effect that they have either been teaching during the past year or are under contract to teach during the coming year. Normal-school graduates (Class 1913) may present either their diploma or a written statement from the President of the normal school certifying that the course has been completed.

Application-blanks for scholarships may be obtained by addressing the Director.

Registration

Students will present themselves for registration on Monday, June 16. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first consult with Dean David Kinley of the Graduate School. (Dean Kinley's office is Room 309, University Hall.)

All fees are due upon registration, and should be paid at the Business office, Room 323, Natural History Building.

General Assembly

On the first Thursday of the Session, at 4 P. M., an Assembly will be held in the Chapel of University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc., and the opportunities and advantages of summer work at the University will be explained.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which are in themselves of no little value, and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

Arrangements have been made with the Ben Greet Players for a series of open-air performances.

The Dramatic, Debating, and Literary Clubs

The Dramatic club will be reorganized during the Summer Session of 1913. Mr. E. M. Halliday, of the Department of Public Speaking, will supervise the work of the club, and a play will probably be presented during the latter part of the Session. The growing importance of the dramatic factor in the English work of the high school makes this feature of the Session particularly attractive to high-school teachers who wish to learn something of the way in which such work may be organized and supervised.

Mr. Halliday will also help in the reorganization of the debating and literary clubs which were interesting and valuable features of the student life during the last Session.

Teachers' Conferences

The informal features of the Session will also include a continuation of the conferences of teachers, superintendents, and principals. The importance of these round-table discussions in supplementing the more formal class exercises was amply demonstrated by the experience of the last Session.

Music Courses and the Summer Session Chorus

Professor Mills, Director of the School of Music, will offer courses in the appreciation, theory and history of music. Certain features of the work will aim to meet the needs of superintendents and principals who may wish to gain an acquaintance with musical theory and methods of teaching that will enable them intelligently to participate in the more general problems of organization and supervision. The side of appreciation will not be neglected. Arrangements will be made to demonstrate the various methods of bringing the best music into the public schools through the medium of the phonograph, the piano-player, and other devices.

In connection with the courses in music, a chorus will be organized among the students. This again will form a valuable object lesson to high-school teachers who wish to form similar organizations in their own schools.

For those who wish private lessons in voice, piano, violin, and musical theory, excellent opportunities will be provided. It will also be possible to secure private instruction in band instruments. Prospective students of the Session who wish to avail themselves of these opportunities should address Director C. H. Mills of the School of Music.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects. The following excerpt from Circular No. 53 of the Office of the State Superintendent of Public Instruction indicates the method of securing State certificates.

"Certificates of qualification issued by the Superintendent of Public Instruction shall be valid in every district of the State during the good behavior of the holder. Such certificates shall be granted only upon a public examination, complete in itself, under such regulations and by such examiners, as the Superintendent of Public Instruction shall prescribe and appoint. The holder of any State certificate, while he continues to teach, shall, annually, before entering upon his duties as a teacher, present his certificate to the county superintendent for registration. A fee of one dollar shall be charged therefor and covered into the institute fund."

The examination will be held July 22 and 23, 1913. Candidates for the "General Certificate" must take the examinations in Springfield. The "State Elementary-School Certificate," the "State High-

School Certificate", and the "State Supervisory Certificate" may be obtained by examinations held on the above dates at the University of Illinois, *provided that at least fifteen applicants notify the State Superintendent prior to June* 10, 1913, *of their wish to take the examination here.* Further information concerning the examinations may be obtained by addressing Hon. F. G. Blair, Springfield, Illinois.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S-1, Principles and Methods of Teaching.

Education S-15, School Hygiene.

Education S-20 and S-24 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S-6; History of Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-9; Educational Psychology. (This course, in connection with Education S-1 should prepare for the examination in educational psychology.)

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Manual Training

The courses in manual training which were offered in 1912 will be repeated during the coming session. They will be in charge of Mr. J. C. Park of the State Normal and Training School in Oswego, N. Y. Mr. Park has had both the training and the experience that are essential to effective instruction in this field. The demand for well qualified teachers of manual training is becoming more and more insistent each year, and the University is not now able to supply even a small fraction of the teachers of manual training that are called for by the schools of the State. The summer work is particularly important in that it will give to the student who has had good preparation in the general engineering courses the ability to adapt his knowledge and skill to the organization of manual training work in the elementary and secondary schools.

Agriculture

The demand for teachers of agriculture in the high schools has led to an extension of the summer offerings in this subject. The courses in secondary school agriculture are planned primarily to meet the needs of teachers of agriculture in the high schools. The courses will include a study of general agriculture adapted to secondary schools, with emphasis placed on the subject-matter of agriculture, and such reference to the methods of presentation as the needs of the class demand. The work was planned in 1912 to continue throughout four summer sessions, the course in each session to cover the work of one year of high school agriculture. This work will be under the direction of A. W. Nolan, Assistant Professor of Agricultural Extension.

Graduate Work in the Summer Session

During the past two years the Summer Session has placed increasing emphasis upon graduate courses leading to the Master's degree. The various departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid upon graduate courses in English, chemistry, and education.

The normal requirements for the Master's degree is satisfactory work continued during one year of residence. This means a residence of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student, by working at the University for one week before or after each Session under the direction of the professor in charge of his major subject, may earn the Master's degree in four summers.

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that

the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigations in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory." Where the investigation of such problems is prosecuted with the coöperation of a university department, it may be possible to count the work toward the Master's degree.

Summer Courses in Library Training

Beginning Monday, June 16, 1913, and continuing for six weeks the Library School will conduct a Summer Session *to which will be admitted only those actually employed as librarians, or library assistants, or under definite appointment to serve in such positions.* The curriculum will be planned to meet especially the needs of workers in public libraries and in high school libraries of Illinois and no tuition fee will be charged students entering from this State; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No university credit is given for the work as offered in 1913.

The work will occupy the whole time of the student. The number of lectures in each subject will be approximately as follows: Cataloging, 20; Classification and book numbers, 13; Book selection, 14; Administration of small libraries, 10; Reference work, 10; Work with children, 10; Loan systems, order, accession and shelf work, binding and repair, 13.

The Library courses are not offered in connection with the Summer Session, but as an independent undertaking of the Library School.

For further information address the Director of the University of Illinois Library School, Urbana, Illinois.

Explanation of Abbreviations, Etc.

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular University year. Summer courses do not always cover the same ground as those similarly numbered in the regular session. Students wishing to know in what respect such courses are similar will be gladly furnished with the desired information upon application to the Director.

The number of credit-hours that may be earned by any course is clearly indicated in every case.

The word "daily" in the announcements of courses indicates that the class meets five times each week (M.T.W.T.F.). Certain classes meet six times a week, and a few meet twice each day for five or six days.

All courses that are granted graduate credit are marked with an asterisk (*). *Courses numbered 100 and above are open only to graduate students.*

The following abbreviations are used to designate the different buildings in which classes are held:

Ag.....College of Agriculture
C.....Chemical Laboratory
C.B.....Commerce Building
E.H.....Engineering Hall
L.A.M.....Laboratory of Applied Mechanics
L.B.....Law Buiding
L.H.....Lincoln Hall
P.L.....Physics Laboratory
N.H.....Natural History Building
T.B.....Transportation Building
U.H.....University Hall
W.H.....Woman's Building

OUTLINE OF COURSES

ACCOUNTANCY

(See also Economics)
Mr. Martin

S 1, II. Principles of Accountancy.—The accounting for various types of business organization, such as the partnership, corporation, etc.; the designing of accounting systems; the treatment of bad debts, goodwill, depreciation, suspense, secret reserves and the like. Special attention is given to problems arising in the teaching of bookkeeping in the high schools. *Open to teachers of bookkeeping.* For University students the prerequisite is Accountancy 1 or its equivalent. M.T.W.T.F., 1,2; 303 C.B.; 2 credit-hours.
Mr. Martin.

AGRICULTURE

Assistant Professor Nolan, Mr. Barto, Mr. Bauer, Mr. Smith, Mr. Durst, Mr. Bole.

The work in the summer session of the University is planned to meet the needs of teachers in the elementary and high schools, teaching agriculture. Courses in the elements of agriculture are outlined to cover suggestive work in high school agriculture.

S 1. Farm Crops.—Classification of farm crops; detailed studies of the principal grain crops, and forage crops; enemies of farm crops; crop rotation; etc. Lectures, laboratory, quizzes, and field work. M.T.W.T.F., 8; 117 Ag.; 2½ credit-hours. Mr. Bauer.

S 2. Soils and Soil Fertility.—Soil conditions essential to plant growth; elements of plant food; sources and supply of nitrogen, organic matter, calcium, potassium and phosphorus. The Illinois system of permanent agriculture. Lectures, recitations and field work. M.T.W.T.F., 1; 118 Ag.; 2½ credit-hours. Mr. Bauer.

S 3. History of Domestic Animals.—Origin, development and management of the various kinds of live stock. This course is designed primarily for secondary school teachers. M.T.W.T.F., 8; 118 Ag.; 2½ credit-hours. Mr. Smith.

S 4. Fundamentals of Live Stock Judging.—The names and location of external parts of the various kinds of live stock, the use of the score card, comparative judging as a method, breed identification, and types of farm animals. M.T.W.T.F., 9; 118 Ag.; 2½ credit-hours. Mr. Smith.

S 5. Orchard and Garden.—Principles of orcharding; the home orchard from planting to bearing; caring for fruit trees; the home vegetable garden. Lectures, recitations, and field work. M.T.W.T.F., 2,3; 559 Ag.; 2½ credit-hours. Mr. Durst, Mr. Bole.

S 6. Special Farm Problems.—Poultry. Types and breeds of poultry; improving and fixing desired strains; care and feeding of poultry; poultry houses; raising young chicks. Lectures, quizzes, and field work. M.T.W.T.F., 3; 700 Ag.; 2½ credit-hours. Mr. Barto.

S 7. Secondary Agriculture.—One-year course. A general course in the elements of agriculture, designed to cover the work offered in a year's high school course. Type studies of farm crops, fruits, animals, soils, business, and special farm problems practical for school work. Lectures, quizzes, and field work. M.T.W.T.F., 10; 117 Ag.; 2½ credit-hours. Assistant Professor Nolan.

S 8. Agricultural Education and Rural Life Problems.—Conferences and discussions of the problems of public school agriculture; the use of text-books, laboratory equipment, and lands; courses of study, extension activities, community work, and country life education. Lectures, reference reading and round-table discussions. W.F., 11; 118 Ag.; 1 credit-hour.
Assistant Professor Nolan.

ART AND DESIGN

Miss Hill

S 1. Elementary.—Form drawing from still life, cast, and nature; principles of outline and shading in pencil, charcoal, and crayon; lectures on the principles of perspective. M.T.W.T.F., 9, 10; 405 U.H.; 2 credit-hours. Miss Hill.

S 20. Art for the Common Schools.—The planning and execution of work in the several divisions of common school art study; design; black-board drawing. Lectures upon organization, equipment, and the administrative side of the supervisor's work. For

supervisors of drawing, and public school teachers. M.T.W.T.F., 3, 4; 405 U.H.; 2 credit-hours.

BIOLOGY

(See Botany, Zoölogy, and Entomology)

BOTANY

Assistant Professor Hottes, Mr. Lehenbauer

S 21. Plant Physiology.—A study of the more important physiological processes of plants. Special attention is given to those processes that are adaptable to the work of the public schools, and that have a practical application in agriculture. Text: Coulter, Barnes, and Cowles, Vol. 2. *A Text-book of Botany.* T.W.T.F., 1, 2; 216 N.H.; 2 credit-hours. Laboratory fee $1.00.

Assistant Professor Hottes, Mr. Lehenbauer.

Prerequisite: Entrance credit in botany or its equivalent.

S 22. Botanical Microtechnique.—Methods of collecting, fixing, and staining of algae and fungi, and the preparation of permanent slides. The treatment of woods and other hard tissues for sectioning; the preparation of permanent sections of leaves, stem, and root tips by the paraffin and celloidin processes, and the methods of staining for a study of tissues and cell division. Text: Chamberlain's *Methods in Plant Histology,* (third edition, 1911). T.W.T.F., 10, 11; 204 N.H.; 2 credit-hours. Laboratory fee $2.00.

Assistant Professor Hottes, Mr. Lehenbauer.

Prerequisite: Bot. S-21 or its equivalent.

S 23. Heredity and Evolution.—Lectures on organic evolution with special reference to variation, selection, and hybridization in plants. A laboratory study of the variation and correlation in plant structures. Text: Lock's *Recent Progress in the Study of Variation, Heredity and Evolution,* (new edition). Lectures T.T., 3; 229 N.H.; laboratory two consecutive hours twice a week, arrange; 204 N.H.; 2 credit-hours. Laboratory fee $1.00.

Assistant Professor Hottes.

Prerequisite: 2 credit hours in botany or zoology.

COURSES FOR GRADUATES

*S 101. Cytology.—The influence of external agents on the cell; special subjects for investigation are assigned upon consultation; reports and discussions of current literature and research results. Laboratory fee $1.50 to $3.00. Arrange hours and credit.

Assistant Professor Hottes.

*S 102. Physiology.—The effects of external stimuli on growth and movement; reports and discussions of recent literature and research results. Laboratory fee $1.50. Arrange hours and credit.

Assistant Professor Hottes.

CHEMISTRY

Assistant Professor Balke, Dr. Derick, Dr. Weber, Dr. Strachan, Dr. Hopkins, Mr. Bell, Mr. Sears, Mr. Kamm.

Graduate Work.—Graduate students whose major subject is not chemistry or agriculture may take for their graduate work S 5a, S 9, S 9a, S 9b, S 14, S 13a, or S 31 and S 33. Students whose major subject is chemistry may take S 111.

S 1. Elementary Chemistry.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements; the course consists of illustrated lectures, recitations, and laboratory work. Text: Alexander Smith's *General Chemistry for Colleges*. Lecture—Quiz, M.T.W.T.F.S., 11; Laboratory, M.T.W.T.F.S., 8, 9, or 9, 10; 321 Chemistry Building; 5 credit-hours.

Assistant Professor Balke, Dr. Hopkins, Mr. Sears, Mr. Kamm.

S 1a and S 1b. Inorganic Chemistry.—For students who have had one year of high school chemistry, or inorganic chemistry for engineering students. These courses may be taken at the same hours as Chemistry S 1, but only half the laboratory time indicated for S 1 is required. 321 Chemistry Building; 4 credit-hours.

Assistant Professor Balke.

S 2. Descriptive Inorganic Chemistry.—A continuation of S 1 and is devoted mainly to the study of the metallic elements, their compounds, and properties; the course consists of illustrated lectures and recitations, but does not include laboratory work. Text: Alexander Smith's *General Chemistry for Colleges*.. M.T.W.T.F., 8; 321 Chemistry Building; 2 credit-hours.

Prerequisite: Chemistry 1.

Assistant Professor Balke.

S 3. Qualitative Analysis.—Lectures, recitations, and laboratory practice in the ordinary processes of qualitative analysis, Noyes and Smith's *Qualitative Analysis.* Lecture, T.T.S., 9; Laboratory, M.T.W.T.F.S., 10, 11; 319 Chemistry Building; 3 credit-hours. Dr. Weber.

Prerequisite: Chemistry 1.

*S 5a. Elementary Quantitative Analysis.—The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods; the lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis.* M.T.W.T.F., 8-12; 212 Chemistry Building; 5 credit-hours. Dr. Strachan.

Prerequisite: Chemistry 1 and 3.

*S 9. Organic Chemistry.—A discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideration of most of the important classes of derivatives of carbon. Text: Moore's *Outline of Organic Chemistry.* M.T.W.T.F.S., 8; 213 Chemistry Building; 3 credit-hours. Dr. Derick, Mr. Kamm.

Prerequisite: Chemistry 2 and 3.

*S 9a.—Organic Synthesis.—This course consists of the preparation of the typical compounds discussed in S 9. Text: Noyes' *Organic Chemistry for the Laboratory..* M.T.W.T.F., 9-12; 213 Chemistry Building; 2 credit-hours. Dr. Derick, Mr. Kamm.

Prerequisite: S 9.

*S 9b. Organic Synthesis.—Continuation of S 9a. Text: Noyes, *Organic Chemistry for the Laboratory.* M.T.W.T.F., 9, 10, 11; 213 Chemistry Building; 2 credit-hours. Dr. Derick, Mr. Kamm.

Prerequisite: S 9a.

*S 14. Organic Chemistry (advanced).—Lectures and recitations. Noyes' *Organic Chemistry.* Daily, arrange; 213 Chemistry Building; 3 credit-hours. Dr. Derick.

Prerequisite: Chemistry S-9 or equivalent.

S 11 and *S 111. Research.—Opportunity will be given for

advanced work and research in inorganic, physical, organic or analytical chemistry. Arrange.

Assistant Professor BALKE, Dr. DERICK, Dr. WEBER.

(Subject to approval of Graduate School Faculty.)

*S 13a. AGRICULTURAL ANALYSIS.—A course arranged to meet the wants of agricultural students; the work includes the gravimetric determination and separation of the more important constituents of soils, fertilizers, and agricultural products. Text: Talbot's *Quantitative Chemical Analysis.* M.T.W.T.F., 8-12; 212 Chemistry Building; 5 credit-hours. Dr. STRACHAN.

S 17. TEACHERS' COURSE.—A study of the methods which may be followed in teaching *elementary chemistry.* Arrange; 321 Chemistry Building; 1 credit-hour. Assistant Professor BALKE.

*S 31. ELEMENTARY PHYSICAL CHEMISTRY.—Some of the more important principles and methods of physical chemistry and electrochemistry; numerous problems. Lectures; recitations. M.T.W.T.F., 8; 124 Chemistry Building; 3 credit-hours. Mr. BELL.

Teachers who have not had calculus will register for S 31a. This course differs from S 31 in that additional outside reading will be required for it.

Prerequisite: Chemistry 1, 2, 3; Physics 1 or 2a; Mathematics 8a.

*S 33. ELEMENTARY PHYSICAL CHEMISTRY.—Molecular weight of gases and solutions; chemical equilibrium; the electrical conductivity of solutions and the attendant phenomena within the solution; thermochemistry. (Laboratory to accompany course 31.) M.T.W.T., 1-4; 128 Chemistry Building; 2 credit-hours. Mr. BELL.

Prerequisite: Chemistry 5a; Physics 26 or 3.

GENERAL ENGINEERING DRAWING

Mr. RUGG

S 1. ELEMENTS OF DRAFTING.—Required of all Engineering students; consists of freehand and mechanical lettering; practice in the use of instruments on standard set of working drawing plates; tracing, machine sketching, isometric and oblique projection, and perspective. Text: Miller's *Mechanical Drafting.* Daily, 8-11; 303 Transportation Building; 4 credit-hours. Mr. RUGG.

S 2. DESCRIPTIVE GEOMETRY.—Problems relating to the point, line, and plane; the properties of surfaces; intersections and developments of surfaces. Text: Miller's *Descriptive Geometry.* Daily, 8-11; 303 Transportation Building; 4 credit-hours. Mr. RUGG.

ECONOMICS

(See also Accountancy)

Professor Robinson, Mr. Martin, Mr. Dowrie

S 2. Principles of Economics.—This is a survey of the general principles of Economics, with special reference to the needs of teachers, general readers and university students. Advanced students of the University who wish to anticipate Economics 2 may do so by taking this course; but under no circumstances will it be accepted as part fulfillment of Economics 1. M.T.W.T.F., section A, 10; 111 C.B.; section B, 11; 101 C.B.; 2 credit-hours.

Professor Robinson, Mr. Martin.

Prerequisite: For University students at least 60 hours of University credit; for teachers and other mature students, enrolled for the summer session only, the permission of the instructor.

S 3. Banking.—This is a general course in the history and principles of banking, with special reference to present conditions in the United States. Special attention is given to proposals for banking reform. This course is open to University students only if they have had Economics 1, and to teachers and others whose general reading and teaching experience are such in the opinion of the instructor as to justify their admission without a formal course in elementary economics. M.T.W.T.F.S., 8; 101 C.B.; 3 credit-hours.

Mr. Dowrie.

S 25. Commercial Law.—The work covers the chief principles underlying the law of contracts, negotiable instruments, agency, partnerships and other forms of business organization as well as insurance, etc. This course is not accepted for credit for students in the courses in Business Administration. M.T.W.T.F., 11; 111 C.B.; 2 credit-hours. Professor Robinson.

S 26. Commercial Geography or Economic Resources and Products of Different Countries.—This course furnishes a study of the more important products and industries of different countries, with special reference to the character and distribution of the resources and economic activities and products of the United States. Open to all students, but University credit will be given only to those who have matriculated in the University. M.T.W.T., 9; 101 C.B.; 2 credit-hours. Mr. Dowrie.

EDUCATION AND PSYCHOLOGY

Professor Bagley, Professor Coffman, Professor Adams, Assistant Professor Anderson, Dr. Ayres, Mr. Miller

COURSES FOR UNDERGRADUATES

S 1. Principles of Education.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; a brief survey of standard methods of instruction. Text: Bagley's *Educative Process.* M.T.W.T.F.S., 8; 202 U.H., 3 credit hours.

Mr. Miller.

S 6. History of Education.—The development of educational theory and practice in their relation to the history of civilization. Text: Monroe's *History of Education.* Brief course. M.T.W.T.F., 9; 103 L.H.; 2½ credit-hours. Assistant Professor Anderson.

S 9. Educational Psychology.—Elementary course. Especially designed to meet the needs of students preparing for the State-certificate examinations. Text: Colvin and Bagley's *Human Behavior.* T.W.T.F., 2; 202 U.H.; 2 credit-hours.

Professor Bagley.

S 15. School Hygiene.—The location and construction of school buildings; hygiene of lighting, heating, and ventilation; school furniture; hygiene of eyesight and hearing; fatigue; infectious diseases. T.W.T.F., 3; 103 L.H.; 2 credit-hours.

Professor Bagley.

S 16. Social Aspects of Education.—Need of a social point of view; social agencies and social forces in relation to the school; the social organization and the social mind of the school; the refractive power of the school; and the school as a determinant of public opinion. Readings, class discussion, lectures. T.W.T.F., 1; 202 U.H.; 2 credit-hours. Professor Coffman.

S 21. Instruction and Control of Individuals and Classes.—Gradual adaptation of psychology to the needs of the teacher; child study and its danger; fundamental differences between individual and class instruction; significant factors in class instruction. M.T.W.T., 10; 202 L.H.; 1 credit-hour; (last 4 weeks.)

Professor Adams.

S 23. Current Educational Movements.—A descriptive survey of some of the important social and educational move-

ments that are now profoundly affecting our public school methods and curricula. Some accomplishments of the last few years in behalf of the health of school children; better adaptation of school work to the needs of the individual; the application of simple scientific methods to educational problems and the adaptation of school work to the vocational needs of our industrial age. M.T.W.T., 10; Lecture Room, C.B.; 1 credit-hour. Dr. AYRES, Professor COFFMAN.

COURSES FOR GRADUATE STUDENTS AND ADVANCED UNDERGRADUATES

(Graduate credit for courses S 22, S 24, and S 125, is subject to the approval of the Executive Faculty of the Graduate School.)

*S 7. HISTORY OF INDUSTRIAL EDUCATION.—An historical survey of the conditions affecting the relation of industrial to general education, especially during the last three or four centuries; the origin and development of school methods of trade instruction; a history of the movement for giving industrial occupations a place in the curriculum of the general school. T.T., 8; 103 L.H.; 1 credit-hour. Assistant Professor ANDERSON.

*S 13. EDUCATIONAL CLASSICS.—A critical and comparative study of the works on education, generally recognized as classics. Each work is studied in the light of the conditions amidst which it was produced; the educational writings of Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, Pestalozzi, Herbart, Froebel, Herbert Spencer, and others. M.W.F., 8; 103 L.H.; 1½ credit-hours. Assistant Professor ANDERSON.

* 20 SUPERVISION.—A course for principals, supervisors, and superintendents. The limitations, types, functions, standards, and devices of supervision. Lectures, assigned readings, special investigations. T.W.T.F., 9; 202 U.H.; 2 credit-hours. Professor COFFMAN.

*S 22. IDEALS AND THEIR PLACE IN EDUCATION.—Nature of mind; nature of knowledge; relation of mind to the external world; relation between sensation and perception in education; historical treatment of the nature and origin of ideas; resulting change in educational ideals and methods; the laws of thought as thought, and their resolution into one primary necessity; consequent possibility of teaching; knowledge as moral organon. M.T.W.T., 11; 103 L.H.; 1 credit hour. (Last 4 weeks.) Professor ADAMS.

*S 24. THEORY AND PRACTICE IN THE MEASUREMENT OF EDUCATIONAL PROCESSES AND PRODUCTS.—A non-technical exposition of the

processes and applications of the newer scientific quantitative methods in education; simple methods of measuring educational processes in terms of educational results. The course is primarily practical, does not require advanced mathematics and deals exclusively with methods of demonstrated utility. M.T.W.T., 11; 202 L.H.; 1 credit-hour. Dr. AYRES, Professor COFFMAN.

*S 125. EDUCATIONAL PSYCHOLOGY.—A study of the monographic literature on the educational aspects of instincts, habits, memory, attention, and the higher thought processes. Th., 4, 5; 103 L.H. Professor BAGLEY.

Prerequisites: Graduate standing and at least one year's undergraduate work in psychology and education.

ENGLISH

Professor DODGE, Professor LIDDELL, Assistant Professor JONES, Assistant Professor PAUL, Mr. HALLIDAY, Dr. TIEJE, Mr. BUCHEN

A.—LITERATURE AND LANGUAGE

S 2a. SURVEY OF ENGLISH LITERATURE.—Nineteenth Century Prose. (This course with S 2b is equivalent to the second half of English 1 as described in the regular catalog. To be credited as such an equivalent, the two parts should be taken simultaneously.) M.T.T.F., 10; 302 U.H.; 2 credit-hours. Professor DODGE.

Prerequisite: Entrance credit in English, or its equivalent.

S 2b. SURVEY OF ENGLISH LITERATURE.—Nineteenth Century Poetry. (This course with S 2a is equivalent to the second half of English 1 as described in the regular catalog.) M.T.T.F., 2; 302 U.H.; 2 credit-hours. Mr. BUCHEN.

Prerequisite: Entrance credit in English, or its equivalent.

S 23. INTRODUCTION TO SHAKESPEARE.—M.T.W.T., 2; 303 U.H.; 2 credit-hours. Assistant Professor PAUL.

Prerequisite: One year of college English or an equivalent.

S 30. WORDSWORTH AND SHELLEY.—A detailed examination of the qualities of their verse and the substance of their interest, considered as introductory to the study of modern poetry. Texts: The *Globe Wordsworth* and the *Cambridge Shelley*. M.T.W.T., 8; 218 L.H.; 2 credit-hours. Professor LIDDELL.

Prerequisite: Two years of college English or an equivalent.

S 15. TEACHERS' COURSE.—Outlining a course in English; the study of typical classics used in high schools; the correcting of

themes; discussion of present tendencies in English teaching. M.T.W.T., 1; 307 U.H.; 2 credit-hours. Assistant Professor PAUL.

Prerequisite: The consent of the instructor.

*S 47. INTRODUCTION TO PROSE FICTION.—A study of the origins of the various types of fiction, of English translations and imitations of foreign fiction before Richardson, and the development of technique with reference to a proper understanding of the modern novel. M.T.T.F., 2; 110 L.H.; 2 credit-hours. Dr. TIEJE.

Prerequisite: Two years of college English or an equivalent.

*S 7. CHAUCER.—An introduction to Middle English, and to the general character and materials of mediaeval literature, as represented by Chaucer. Text: Skeat's *Student's Chaucer.* M.T.T.F., 9; 218 L.H.; 2 credit-hours. Assistant Professor JONES.

Prerequisite: Two years of college English or an equivalent.

*S 8a. OLD ENGLISH (ANGLO-SAXON).—(This course is equivalent to the first half of English 8 as described in the regular catalog.) Text: Bright's *Anglo-Saxon Reader.* M.T.W.T.F., 9; 110 L.H.; 3 credit-hours. Professor DODGE.

Prerequisite: Two years of college English, or one year of English and one of German.

*S 120. SHAKESPEARE (ADVANCED COURSE).—A detailed treatment of Elizabethan English, in the light of modern scholarship, as related to a clear understanding of Shakespeare's meaning and literary interest. Text: *The Tempest* in Furness's Variorum or in the First Folio Edition. M.T.W.T., 10; 218 L.H.; 2 credit-hours. Professor LIDDELL.

Prerequisite: Three years of college English.

B.—RHETORIC

I. Composition

S 1a. RHETORIC AND THEMES.—(This course is equivalent to the first half of Rhetoric 1 as described in the regular catalog.) Texts: Woolley's *Handbook of Composition* and Scott and Denney's *Paragraph Writing.* M.T.W.T.F.S., 11; 307 U.H.; 3 credit-hours. Mr. BUCHEN.

Prerequisite: Entrance credit in English, or its equivalent.

S 1b. RHETORIC AND THEMES.—(This course is equivalent to the second half of Rhetoric 1 as described in the regular catalog.)

Text: Scott and Denney's *Paragraph Writing.* M.T.W.T.F.S., 11; 303 U.H.; 3 credit-hours. Dr. TIEJE.

Prerequisite: Rhetoric 1a or an equivalent.

S 3. ADVANCED COMPOSITION.—This course will be adapted to the needs of those registering for it. M.T.T.F., 11; 110 L.H.; 2 credit-hours. Assistant Professor JONES.

Prerequisite: Rhetoric 1 or an equivalent.

II. Public Speaking

S 7a. PUBLIC SPEAKING.—The elements of public speaking, with drill in breathing, articulation, and gesture; reading aloud, and the delivery of memorized selections. (Equivalent to the first half of Rhetoric 7 as described in the regular catalog.) M.T.W.T., 8; 318 U.H.; 2 credit-hours. Mr. HALLIDAY.

Prerequisite: Rhetoric 1 or an equivalent.

S 8. INTERPRETIVE READING.—The study and interpretation of English classics selected from among those most frequently taught in the high school. T.T., 11; 320 U.H.; 1 credit-hour. Mr. HALLIDAY.

Prerequisite: Rhetoric 7 or an equivalent.

S 11. ORAL COMPOSITION.—The principles and methods of oral composition, with special reference to the work of the public school; individual practice, with criticism. (This course should be preceded or accompanied by course 7.) T.T., 9; 320 U.H.; 1 credit-hour. Mr. HALLIDAY.

Prerequisite: Rhetoric 1 or an equivalent.

ENTOMOLOGY

Assistant Professor FOLSOM, Mr. PETERSON

S 1. GENERAL FIELD AND LABORATORY COURSE.—Planned to meet the needs of high-school teachers. Covers the most essential facts of entomology, emphasizing those of economic importance. Lectures, laboratory studies, and field observations. Text: Folsom's *Entomology with Reference to Its Biological and Economic Aspects.* M.T.W.T.F., 1, 2; 405 N.H.; 2½ credit-hours.

Assistant Professor FOLSOM.

S 2. ADVANCED COURSE.—Instruction in several lines of advanced entomological study to meet the purposes of the individual student. Arrange; 405 N.H.; 2½ credit-hours.

Assistant Professor FOLSOM.

S 3. Economic Entomology.—In the laboratory the student learns to recognize our common injurious insects in all their stages of development; in the field he gains a personal knowledge of their injurious activities. The lectures summarize the important facts relating to each insect pest, with special consideration of the most approved methods of control. This course is equivalent to the economic entomology [Entomology 4] required of agricultural students. M.T.W.T.F., 1,2; 408 N.H.; 2½ credit-hours.

Assistant Professor Folsom.

FRENCH

Associate Professor Carnahan, Mr. Lillehei

S 1. Beginners' Course.—Pronunciation, grammar, composition, reading of easy texts. Texts: Fraser and Squair's *Elementary French Grammar;* Bacon's *Une Semaine à Paris.* M., 9; T.W.T.F., 8,9; 208 U.H.; 4 credit-hours. Mr. Lillehei.

S 2. Reading of Modern French.—Rapid reading of modern authors, composition, conversation. Texts: Comfort's *Prose Composition; Colomba* Mérimée; *Pêcheur d'Islande,* Loti; *Le Juif Polonais,* Erckmann-Chatrian; *Hernani,* Hugo. M.T.W.T.F., 8; 207 U.H.; 2 credit-hours. Associate Professor Carnahan.

Prerequisite: French 1 or an equivalent.

Note: Students who secure a grade of 85 or more and who do additional work assigned by the instructor may supplement the work of S 2, and make it the equivalent of the regular university course, French 2, the additional credit to be indicated at registration.

S 4. Advanced Composition and Conversation.—Practice in speaking and writing simple French. Talks by the instructor in French on life and customs of the French people. M.W., 9; 207 U.H.; 1 credit-hour. Associate Professor Carnahan.

Prerequisite: Two years of university French or an equivalent.

*S 10. History of French Literature.—A rapid survey of the field of French literature. Lectures with collateral reading. T.T., 9; 211 L.H.; 1 credit-hour, or more by arrangement at registration. Associate Professor Carnahan.

Prerequisite: Two years of university French or an equivalent.

GERMAN

Professor Lessing, Dr. Koller, Mr. Barto, Mr. Held

S 1. Beginners' Course.—Section A, M., 9; T.W.T.F., 8, 9; 312 U.H.; section B, M., 10; T.W.T.F., 10, 11; 310 U.H.; 4 credit-hours. Professor Lessing, Mr. Held.

S 2. Intermediate Course.—(Open to those who have had German 1 of the regular University year or an equivalent.) M.T.W.T.F.S., 8; 202 U.H.; 3 credit-hours. Mr. Barto.

S 3. Prose Reading.—Reading of narrative prose, sight translation, composition. (Open to those who have had German 3 of the regular University year or an equivalent.) M.T.W.T.F.S., 9; 202 U.H.; 3 credit-hours. Dr. Koller.

S 4. Readings From the Classics.—Lessing's *Minna von Barnhelm,* Schiller's *Jungfrau Von Orleans.*. (Open to those who have had German 4 of the regular University year or an equivalent.) M.T.W.T.F.S., 9; 311 U.H.; 3 credit-hours. Mr. Barto.

Note: Students securing a grade of 85 or more and doing additional work assigned by the instructor, may supplement the work of S 2, S 3, or S 4, making it the equivalent of the University courses 3, 4, or 5, respectively, the additional credit to be indicated at registration.

S 5. Prose Composition.—Translation of ordinary prose into German; study of idiomatic constructions; practice in free composition in German. (Open to those who have had two years of University German or an equivalent.) M.W.F., 10; 310 U.H.; 1½ credit-hours. Mr. Held.

S 6. Modern Fiction.—Reading of modern authors, such as Keller, Meyer and Storm. (Open to those who have had two years of University German or an equivalent.) T.W.T.F., 8; 311 U.H.; 2 credit-hours. Dr. Koller.

S 9. Teachers' Course.—Place, aim and scope of the study of German in the high school; discussion of methods and the chief difficulties in teaching German. Observation work in the beginners' course. (Open to those who have taught German or to those who have had three years of University German or an equivalent.) T.T., 10; 312 U.H.; 1 credit-hour. Dr. Koller.

S 11. History of German Literature From the Reformation to the Present Time.—(Open to those who have had three years of University German or an equivalent.) M.W.F., 9; 312 U.H.; 2 credit-hours. Professor Lessing.

HISTORY

Professor Ford, Dr. Cole

S 1b. European History, 1300-1648.—The Renaissance, the Protestant Revolution; the Thirty Years War; the beginnings of national States. An introductory course corresponding, for the period covered, to History I, as given during the regular University session. (It is the plan of the department to cover the field of medieval and modern European history in three courses in succeeding summer sessions. The course given next year will probably cover the modern period.) M.T.W.T.F., 8; 311 L.H.; 2½ credit-hours.

Professor Ford.

S 3c. American History, 1860-1898.—The Civil War; the Reconstruction of the Southern States; American society and politics in the last years of the nineteenth century. M.T.W.T.F., 10; 305 L.H.; 2½ credit-hours. Dr. Cole.

History in Secondary Schools.—There will be a weekly conference of teachers of history and others, under the direction of Dr. A. C. Cole, for the purpose of considering the special problems of historical teaching in secondary schools.

COURSE FOR GRADUATES AND ADVANCED UNDERGRADUATES

(*Junior or senior standing required.*)

*S 22. The History of the United States, 1815-1845.—The Monroe Doctrine; the westward movement; Jacksonian Democracy and the Whig Party. M.T.W.T.F., 11; 305 L.H., 2½ credit-hours.

Dr. Cole.

Prerequisite: One college course in American history or its equivalent.

COURSE FOR GRADUATES

*S 101. Investigation of Selected Topics.—Conferences with graduate students who desire guidance in research. Arrange.

Professor Ford.

Prerequisite: This course is open only to students regularly registered in the Graduate School who have had at least one college course in American history. The instructor should be consulted before registration.

HOUSEHOLD SCIENCE

Miss Biester, Miss Parsons, Miss Fleming

Foods.—The work offered in foods is of two grades. A, That designed for those who have studied or taught household science and wish to prepare themselves to teach it in high schools. B, Advanced work dealing with the general subject of nutrition.

S 1. A study of the sources and cost of foods, the cooking of various types of foods, and the combinations of food as shown in planning and service of meals. Text: *Selection and Preparation of Food.* Reference work in addition. Laboratory, M.W.F., 10, 11; Lecture, Tu., 10; Quiz, Th., 10; W.H.; 1½ credit hours. Laboratory Fee, $2.00. Miss Biester.

S 2. A study of the relative nutritive value of foods; the methods of estimating dietetic values; the relation of foods to the human body. Laboratory, T.Th., 8, 9; Lecture, M., 8; Quiz, W.F., 8; W.H.; 1½ credit-hours. Laboratory Fee, $2.00. Miss Biester.

Prerequisite: A year's work of college rank with foods; a year of general chemistry; a course in general physiology.

S 3. Lunch Room Management.—Designed to prepare students to take charge of lunch rooms. It aims to make the student familiar with the history of the movement to feed school children, and also to give her the practice in lunch room management which is essential to such work. Three three-hour periods per week. Arrange time. W.H.; 1½ credit-hours. Laboratory Fee, $3.00. Miss Parsons.

Prerequisite: Work equivalent to a year's training in food principles; practical experience in house management and marketing.

S 4. Clothing.—A study of the textiles used in clothing; demonstrations in the use of patterns; drafting; a discussion of the cost and care of clothing; the use and care of sewing machines; laboratory work in the making of undergarments, a shirt waist and a cotton dress. Lecture and discussion. M., 2; Laboratory and demonstration, T.Th., 1, 2, 3; W.H.; 1 credit-hour. Miss Fleming.

5. Millinery.—Demonstrations and laboratory work in the construction of frames of wire, buckram and cape net; the covering and finishing; the making of bows. Demonstrations and laboratory. W.F., 1, 2, 3; W.H.; 1 credit-hour. Miss Fleming.

LATIN

Professor Barton, Associate Professor Oldfather

S 1. Terence.—Two plays will be read with proper attention to language, verse, and scenic antiquities. For those who have had three or four years of High School Latin. M.W.F., 10; 108 L.H.; 1½ credit-hours. Associate Professor Oldfather.

S 2. Cicero.—Readings from his philosophical works and essays. For those who have had two or three years of College Latin or the equivalent. M.W.F., 11; 108 L.H.; 1½ credit-hours.

Associate Professor Oldfather.

*S 3. Suetonius.—Readings from the Caesars with lectures on the biography, the literary work, and the style of Suetonius. For graduates and advanced undergraduates. T.Th., 11; 108 L.H.; 1 credit-hour. Associate Professor Oldfather.

S 4. Teachers' Course.—Special attention to the problems and methods of instruction in Latin in the secondary schools; the essentials of Latin study in the first and second years; books and equipment. T.Th. S., 9; 120 L.H.; 1½ credit-hours.

Professor Barton.

MANUAL TRAINING

Mr. Park

(See also Art and Design, General Engineering Drawing, and Mechanical Engineering)

S 1. Shop Administration.—History and theory of industrial education; a study of typical schools and systems of manual training leading to a better understanding of the aims and methods employed in various schemes for the promotion of industrial education; organization of work; a study of equipments and materials. Daily, 8; Lecture Room, Wood Shops; 2½ credit-hours.

Mr. Park.

S 2. Woodworking.—(A course for teachers in the 7th and 8th Grades and high schools.) Includes a study of tools—as uses, names of parts, adjustments, care of, and how to sharpen; the making of important joints used in wood construction and the application of these joints to the making of useful and interesting projects; the designing and making of arts and crafts furniture; notebook work, covering talks, papers, problems, etc.; strenuous

work at the bench. Daily, 9, 10, 11; Wood Shop; 3 credit-hours. Mr. Park.

The following courses in Mechanical Engineering will be of interest to students in Manual Training.

S 1. Pattern-Shop.—The care and use of tools; the construction of patterns, core-boxes, and the use of machines such as are found in modern pattern-shops. Daily, 9, 10, 11; Wood Shop; 3 credit-hours. Mr. Ellis.

S 3. Machine-Shop.—Chipping and filing; elementary work on lathe, drill press, shaper, planer, and grinding machine. Daily. 2, 3, 4; Machine Shop; 2½ credit-hours. Mr. Scroggin.

S 4. Advanced Machine-Shop.—The use of milling machine, screw machine, gear cutter, boring mill and turret lathe; erecting and testing of machines and gas engines. *Daily*, 2, 3, 4; Machine Shop; 2½ credit-hours. Mr. Scroggin.

MATHEMATICS

Dr. Crathorne, Dr. Borger, Mr. Carscallen, Mr. Rowland, Mr. Rutledge

S 2. Algebra.—(Equivalent to the course offered in the University on the same subject.) Algebraic reductions; variables and functions; equations; inequalities; mathematical induction; variation; progressions; complex numbers; limits; infinite series; undetermined coefficients. (Theory of equations will be given with Math. S 6.) Text: Rietz and Crathorne's *College Algebra*. M.T.W.T.F.S., 8; 420 N.H.; 3 credit-hours. Dr. Crathorne.

S 4. Plane Trigonometry.—(Equivalent to Mathematics 4.) Text: Rothrock's *Elements of Plane and Spherical Trigonometry*. M.T.W.T.F., 9; 425 N.H.; 2 credit-hours. Dr. Borger.

S 6. Analytical Geometry.—(Equivalent to Mathematics 6.) An introductory course in plane and solid analytic geometry; the theory of equations is developed in this course along with the study of the corresponding graphs. Text: Rigg's *Analytic Geometry*. M.T.W.T.F., 1 and 2; 418 N.H.; 5 credit-hours. Mr. Rutledge.

S 7. Differential Calculus.—(Equivalent to Mathematics 7.) Text: Townsend and Goodenough's *Essentials of Calculus*. M.T.W.T.F., 8 and 9; 431 N.H.; 5 credit-hours. Mr. Rowland.

S 9. Integral Calculus.—(Equivalent to Mathematics 9.) Text: Townsend and Goodenough's *Essentials of Calculus*. M.T.W.T.F.S., 9; 419 N.H.; 3 credit-hours. Mr. Carscallen.

*S 10. Theory of Equations and Determinants.—Some of the fundamental properties of an algebraic equation in one unknown; the solutions of systems of simultaneous equations; theory of a system of linear equations; some fundamental properties of determinants. M.T.W.T.F.S., 10; 425 N.H.; 3 credit-hours. Dr. Borger.

*S 20. Calculus of Variations.—An introductory course discussing the necessary and sufficient conditions for a maximum or a minimum of a definite integral. The methods of Weierstrass, Kneser and Hilbert are used and applied to geometrical and physical problems. M.T.W.T.F., 11; 420 N.H.; 3 credit-hours. Dr. Crathorne.

MECHANICAL ENGINEERING

(See also Manual Training)

Mr. Ellis, Mr. Scroggin

S 1. Pattern-Shop.—The care and use of tools; the construction of patterns, core-boxes, and the use of machines such as are found in modern pattern-shops. Daily, 9, 10, 11; Wood-Shop; 3 credit-hours. Mr. Ellis.

S 3. Machine-Shop.—Chipping and filing; elementary work on lathe, drill press, shaper, planer and grinding machine. *Daily, 2, 3, 4*; Machine Shop; 2½ credit-hours. Mr. Scroggin.

S 4. Advanced Machine-Shop.—The use of milling machine, screw machine, gear cutter, boring mill and turret lathe; erecting and testing machines and gas engines. *Daily, 2, 3, 4*; Machine Shop; 2½ credit-hours. Mr. Scroggin.

Note: The lectures on tools and shop processes are given frequently, and inspection trips to shops in the local and adjoining towns are made in connection with all classes in shop practice. A student may finish one full year's work in the shop during the summer term.

MECHANICS, THEORETICAL AND APPLIED

Mr. Noerenberg, Mr. Farwell, Mr. Ensign

S 7. Analytical Mechanics.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics*. *Daily*, 10; 202 E.H.; 3 credit-hours. Mr. Noerenberg.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 8. Analytical Mechanics.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* Daily, 10; 208 E.H.; 2½ credit-hours. Mr. Ensign.

Prerequisite: Mathematics 9 and T. & A. M. 7.

S 9. Resistance of Materials.—Training in the elementary principles of the mechanics of materials, with experiments and investigations in the materials laboratory to verify the experimental laws; problems in ordinary engineering practice to train the student in the use of his knowledge. This course covers the same ground both in text-book, problem work, and in experiments in the materials testing laboratory as T. and A. M. 9. Merriman's *Mechanics of Materials. Daily,* 11; 208 E.H.; M.W., 8, 9; L.A.M.; 3½ credit-hours. Mr. Ensign, Mr. Farwell.

Prerequisite: T. and A. M. 7 and registration in T. and A. M. 8.

S 10. Hydraulics.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observation and measurement of pressure, velocity, and flow, in power and efficiency, and in the determination of experimental coefficients. Hoskin's *Hydraulics.* M.T.W.T., 2; 202 E.H.; T.T., 8, 9; Hyd. Lab.; 3 credit-hours. Mr. Farwell.

Prerequisite: T. and A. M. 8.

Note: With the opening of the hydraulic laboratory for the Summer School, arrangements may be made to use its facilities for special experimental work.

S 14. Elements of Mechanics.—The principles of kinematics, kinetics, and statics and their application. Moreley's *Mechanics for Engineers.* (For architects and others who have not taken the calculus.) M.W.F.S., 8, and T.T., 8-10; 202 E.H.; 4 credit-hours. Mr. Noerenberg.

Prerequisite: Mathematics 2, 4.

MUSIC

Professor Mills

S 1. Theory and Harmony.—M.W.T., 9; 103 U.H.; 1½ credit-hours.

S 2. Counterpoint and Fugue.—M.T.W.T., 10; 103 U.H.; 2 credit-hours.

S 3. History, Appreciation and Form.—T.T., 11; 103 U.H.; 1 credit-hour. Professor Mills.

Chorus, Th., 4.

PHYSICAL TRAINING FOR MEN

Mr. Manley

S 3. Swimming Instruction.—T.T., 4; S., 11. Mr. Manley.

Note: The pool will be open M.T.W.T.F., from 2-6; S., 10-12, to all students procuring a locker in the gymnasium.

PHYSICS

Dr. Williams, Mr. Jones, Mr. Randolph, Mr. Warner, Mr. Coyle.

S 2aI. General Physics Part 1.—Lectures with experimental demonstrations and recitations. The topic treated in this course in 1913 will be mechanics which will include the fundamental laws of motion, forces and their effects, equilibrium, etc. Course S 2bI should be taken with S 2aI. Text: Kimball's *College Physics.* M.W.F., 9; Lecture Room 119 Physics Building; 1½ credit-hours.

Dr. Williams, Mr. Jones

Prerequisite: Plane geometry and high school algebra. Plane trigonometry desired.

S 2bI. Introductory Laboratory Physics Part 1.—A laboratory course in physical measurements, mechanics, properties of matters, etc., to accompany S 2aI. Schulz's *Laboratory Manual.* M.W.F., 2-4; 212 Physics Building; 1½ credit-hours.

Mr. Jones, Mr. Warner, Mr. Coyle.

Prerequisites: Registration in S 2aI.

S 2aII. General Physics Part 2.—Lectures with experimental demonstrations. Topics treated in this course in 1913 will be electricity and magnetism. Course S 2bII should be taken with S 2aII. Text: Kimball's *College Physics.* T.T.S., 9; Lecture Room 119 Physics Building; 1½ credit-hours.

Dr. Williams, Mr. Jones

Prerequisites: Same as for S 2aI.

S 2bII. Introductory Laboratory Physics Part 2.—A laboratory course of fundamental experiments in electricity and magnetism to accompany S 2aII. Text: Schulz's *Laboratory Manual.* T.T., 2-4; S. 10-12; 212 Physics Building; 1½ credit-hours.

Mr. Jones, Mr. Warner, Mr. Coyle.

S 4. Electrical and Magnetic Measurements.—An advanced laboratory course with discussions, recitations and reports. This course covers the work done in Physics 4 for the first semester. Students in electrical engineering whose work is irregular can do the first semester of electrical measurements in the summer session and finish with the class during the second semester. M.T.T.F., 1-4; 112 Physics Building; 2 credit-hours.

Mr. Randolph

Prerequisites: A course in general physics and calculus.

S 15. Electricity and Magnetism.—Lectures, recitations and laboratory work. The course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory, than that given in the courses in general physics. The apparatus and laboratory methods used call for high accuracy. The texts of Brooks and Poyser and Carhart and Patterson, with selected reference books, are used. M.W.F., 1-4; 112 Physics Building; 1½ credit-hours. Mr. Randolph.

Prerequisite: A course in general physics.

S 16. Heat.—Lectures, demonstrations and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, vapor pressure, expansion, etc. This is an intermediate course recommended to students who have already had a course in general physics or wish a more extended knowledge of heat than is covered in general physics. Text: Edser's *Heat.* T.T.S., 10-12. Lecture Room 119 Physics Building; 1½ credit-hours. Dr. Williams, Mr. Warner

Prerequisites: A course in general physics. See instructor in special cases.

S 18. Laboratory Manipulation.—Discussion of the practical problems involved in the equipment for laboratory physics with exercises in glass blowing, making of simple apparatus, handling of tools, etc. M. 1-4; 208 Physics Building; 1 credit-hour.

Mr. Jones

Prerequisite: A course in general physics, enrollment in such course, or teaching experience in physics.

*S 31. Investigation of Special Problems.—This course is for advanced students, undergraduates or graduates, who are prepared to take up some special line of experimental work. The apparatus equipment and facilities of the laboratory are large and

varied. Special attention will be paid to advanced work in heat, and in electricity and magnetism, during the present summer session. Two to five times weekly. Dr. WILLIAMS

*S 133. SEMINAR AND THESIS.—The facilities of the laboratory are open to graduate students working on special investigations. A well equipped machine shop affords the means of making special apparatus as needed. A number of the professors and instructors of the department work in the laboratory in the summer and direct and advise students in this advanced work. Those desiring this work should if possible write in advance to Professor Carman for arrangements.

POLITICAL SCIENCE

Professor GETTELL (Trinity College, Connecticut.)

S 1. AMERICAN GOVERNMENT.—The historical development of the Constitution; the organization and functions of American federal and state governments; political parties in the United States; the general problems of American municipal and colonial government. *Daily,* 9; 317 L.H.; 2½ credit-hours.

Professor GETTELL

S 2. COMPARATIVE GOVERNMENT.—The fundamental principles of the state and of government; comparison of the historical development and of the organization and actual workings of government in leading modern states, especially in England, Germany, France, and the United States. *Daily,* 10; 317 L.H.; 2½ credit-hours. Professor GETTELL

PSYCHOLOGY

(See EDUCATION AND PSYCHOLOGY.)

RHETORIC

(See English)

SOCIOLOGY

Professor HAYES

*S 1. PRINCIPLES OF SOCIOLOGY.—Principles which underlie the practical problems of education and progress. Lectures, discussions and assigned reading. T.W.T.F., 11; 306 L.H.; 2 credit-hours. Professor HAYES

S 5. Charities and Correction.—Causes, prevention and treatment of poverty and crime. T.W.T.F., 2; 306 L.H.; 2 credit-hours. Professor Hayes

S 7. Social Problems of the Rural Community.—T.T., 3; 306 L. H.; 1 credit-hour. Professor Hayes

ZOOLOGY

Assistant Professor Carpenter, Mr. Cort, Mr. ————

S 4. Elementary Vertebrate Zoology.—Classification of the Chordata; early development of the vertebrate body; comparative anatomy and physiology of the vertebrate organs. Laboratory studies of selected types of vertebrates including Amphioxus, a fish, amphibian and mammal. Suited to the needs of the general student, and especially designed to serve as a broad anatomical basis for teaching human physiology in secondary schools. Lectures, M.W.F., 9; Laboratory five times a week, 10-12; 312 N. H.; 4 credit-hours. Laboratory fee, $2.50.

Assistant Professor Carpenter and Mr. Cort

S 16. Ornithology.—Studies of birds of the vicinity. Identification; food relations; nesting habits; seasonal distribution, etc. Of special value to teachers of nature study. Lectures, field trips, and laboratory. (Students are advised to provide themselves with opera or field glasses. A limited number of these can be obtained from the department for use in the course). T.T.S., 8-10, 2-4. 2 credit-hours. Mr. ————

*S 21. Introduction to Zoological Research.—Topics in vertebrate morphology, usually repeating the work of earlier investigators. Special facilities will be provided for studies on the histology of the nervous system. For graduates and advanced undergraduates. Conferences, laboratory, assigned readings. Mornings, as arranged. 2 to 4 credit-hours. Laboratory fee, $2.00.

Assistant Professor Carpenter

*S 121. Problems in Vertebrate Morphology.—Individual research in the field of vertebrate embryology or anatomy. Primarily for graduate students. Conferences, laboratory. Arrange hours and credit. Laboratory fee, $2.00.

Assistant Professor Carpenter

University of Illinois Location

The University of Illinois is situated in Champaign County in the eastern central part of the State between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis Railroads. The cities of Urbana and Champaign have together a population of 20,000.

The institution was incorporated February 28, 1867, under the name, the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred and twenty acres, besides a farm of four hundred acres. The buildings at Urbana are twenty-eight in number, and consist of the Agricultural Building, the Agronomy Building, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the Library, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, the Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop and Foundry. The Commerce Building, the Transportation Building, and a large addition to the Woman's Building have been completed this year. Work on the new Armory is just beginning.

Libraries

The general University library, the library of the State Laboratory of Natural History, that of the Agricultural Experiment Station, and that of the College of Law are all at the University in Urbana.

The general University library, including the Agricultural Experiment Station library, contains 166,000 volumes and pamphlets.

The reading room contains over 3,100 bound volumes of periodicals. The University has a subscription list of 1,112 periodicals, the current numbers of which are kept in the east-tower reading room. The library of the State Laboratory of Natural History contains 6,060 volumes and 16,440 pamphlets. The Library of the College of Law contains the Federal and State Reports, the leading text-books, and the leading periodicals.

Athletics

Because of changes in the women's gymnasium no regular class work in Physical Training for women will be offered. Both of the gymnasiums are new and well equipped. Each contains swimming pool, shower, and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts upon the University campus are open to the student body. The general athletic fields will be open to the students. The golf links, which are in the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, base-ball clubs, etc.

Boarding and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board can be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or

W. C. Bagley, Director
W. S. Miller, Secretary
Room 203, University Hall,
Urbana, Illinois.

The University of Illinois

Summer Session

June 22 to August 14, 1914

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UNIVERSITY OF ILLINOIS

Edmund Janes James, Ph.D., LL.D., President of the University.

William Chandler Bagley, Ph.D., Director of the School of Education; *Director of the Summer Session.* (Office, Room 203, University Hall.)

George Enfield Frazer, Comptroller.

Charles Maxwell McConn, A.M., Registrar and Secretary. (Office, Natural History Building.)

CALENDAR

SUMMER SESSION

June 22, 1914, Monday	Registration Day
August 13 and 14, Thursday and Friday	Final Examinations

FIRST SEMESTER

September 14 to 18, Monday to Friday	Entrance Examination
September 21 and 22, Monday and Tuesday	Registration Days
September 23, Wednesday, 8 A. M.	Instruction Begins

ANNUAL REGISTRATION OF STUDENTS

'94-'95	810
'95-'96	855
'96-'97	1075
'97-'98	1585
'98-'99	1825
'99-'00	2234
'00-'01	2505
'01-'02	2950
'02-'03	3288
'03-'04	3594
'04-'05	3729
'05-'06	4070
'06-'07	4316
'07-'08	4743
'08-'09	4977
'09-'10	5118
'10-'11	5217
'11-'12	5200
'12-'13	5087
'13-'14	5529

STAFF OF INSTRUCTION

SUMMER SESSION, 1914

Anderson, Lewis Flint, Ph.D., Assistant Professor of Education.

Bagley, William Chandler, Ph.D., Professor of Education.

Balke, Clarence William, Ph.D., Professor of Inorganic Chemistry.

Bauer, Frederick Charles, B.S., Associate in Soil Fertility.

Barker, Franklin Davis, Ph.D., Professor of Zoology, University of Nebraska.

Barto, Philip Stephan, A.M., Instructor in German.

Barton, Herbert Jewett, A.M., Professor of Latin Language and Literature.

Beal, George Denton, Ph.D., Instructor in Chemistry.

Brainard, Adeline, Assistant in Music.

Brooks, Verna, A.B., Instructor in Physical Training for Women.

Buchen, Walter, A.M., Assistant in English.

Canter, Howard Vernon, Ph.D., Assistant Professor of Classics.

Carlton, Frank Tracy, Ph.D., Professor of Economics, Albion College, Michigan.

Carry, Charles Serophin, Assistant in Romance Language.

Casner, Sidney, Assistant in Physical Training.

Coffman, Lotus Delta, Ph.D., Professor of Education.

Cooper, Lane, Ph.D., Assistant Professor of English, Cornell University.

Creek, Herbert Le Sourd, Ph.D., Instructor in English.

Cushing, Sumner Webster, S.B., A.M., State Normal School, Salem, Massachusetts.

Derick, Clarence George, Ph.D., Assistant Professor of Chemistry.

Dodge, Daniel Kilham, Ph.D., Professor of English Language and Literature.

Ensign, Newton Edward, A.B., B.S., Instructor in Theoretical and Applied Mechanics.

Fleming, Georgia, B.S., Instructor in Textiles.

Folsom, Justus Watson, D.Sc., Assistant Professor of Entomology.

Gardner, John J., B.S., Instructor in Pomology.

Gill, Harry Lovering, Instructor in Track Athletics.

Gonnerman, Harrison Frederick, M.S., Instructor in Theoretical and Applied Mechanics.

Gross, Gustave Adolph, Instructor in Woodworking.

Guild, Thacher Howland, A.M., Associate in English.

Hague, Stella Mary, Ph.D., Instructor in Botany.

Hall-Quest, Alfred Lawrence, A.M., Assistant in Education.

Harlan, Charles Leroy, A.B., Assistant in Education.

Heitkamp, George William, A.B., Assistant in Physiography.

Held, Felix Emil, A.M., Assistant in German.

Hill, Mary, Assistant in Art and Design.

Hopkins, B. Smith, Ph.D., Instructor in Chemistry.

Huff, George A., Director of Physical Training for Men.

Jamison, Albert Woodward, M.S., Associate in Agricultural Extension.

Johnston, Charles Hughes, Ph.D., Professor of Secondary Education.

Jones, Ralph R., Basket Ball Coach.

Jordan, Harvey Herbert, B.S., Instructor in General Engineering Drawing.

Kamm, Oliver, B.S., Assistant in Chemistry.

Kempner, Aubrey J., Ph.D., Instructor in Mathematics.

Koller, Armin Hajman, Ph.D., Instructor in German.

Lessing, Otto Edward, Ph.D., Professor of German.

Litman, Simon, Dr. Jur. Pub. et Rer. Cam., Assistant Professor of Economics.

Lytle, Ernest Barnes, Ph.D., Associate in Mathematics.

MacInnes, Duncan Arthur, Ph.D., Instructor in Chemistry.

Miller, William Pitt, B.S., Assistant in Agriculture.

Miller, Wilford Stanton, A.M., Assistant in Education and Secretary of the School of Education.

Moran, Thomas Francis, Ph.D., Professor of History, Purdue University.

Nathanson, Jonas Bernard, A.M., Assistant in Physics.

Oliver, Thomas Edward, Ph.D., Professor of Romance Language.

Packard, Wales Harrison, Ph.D., Instructor in Zoology.

Park, Joseph C., Director of Industrial Education, Oswego, New York.

Parsons, Maud, A.B., Assistant in Household Science and Director of Lunch Room.

Paul, Harry Gilbert, Ph.D., Assistant Professor of English Language and Literature.

Peterson, Alvah, B.S., Assistant in Entomology.

Radebaugh, Gustave Howard, Instructor in Machine Work.

Rapeer, Louis W., Ph.D., New York Training School for Teachers.

Richardson, Robert Kimball, Ph.D., Professor of History in Beloit College.

Roberts, Elmer, B.S., Assistant in Agriculture.

Robertson, William Spencer, Ph.D., Assistant Professor of History.

Rowland, Sidney Archie, A.B., Assistant in Mathematics.

Rutledge, George, A.B., Research Assistant in Mathematics.

Sears, George Wallace, M.S., Assistant in Chemistry.

Seely, Fred B., B.S., Instructor in Theoretical and Applied Mechanics.

Smith, Constance Barlow, Assistant Professor of Music.

Smith, Orrin Harold, A.B., A.M., Assistant in Physics.

Smith, William Herschel, M.S., Instructor in Animal Husbandry.

Story, Russel, A.M., Instructor in Political Science.

Thompson, Charles Manfred, Ph.D., Instructor in Economic History.

Tieje, Arthur Jerrold, Ph.D., Instructor in English.

Trelease, William, D.Sc., LL.D., Professor of Botany and Head of Department.

Wahlin, Gustaf Eric, Ph.D., Associate in Mathematics.

Warner, Earle Horace, A.B., Assistant in Physics.

Watson, Floyd Rowe, Ph.D., Assistant Professor of Physics.

Weatherly, Ulysses Grant, Ph.D., Professor of Sociology, Indiana University.

Weber, Henry Charles Paul, Ph.D., Assistant Professor of Chemistry.

Williams, Anna Waller, A.M., Instructor in Household Science.

Williams, Elmer Howard, Ph.D., Associate in Physics.

Zuppke, Robert Carl, Foot Ball Coach.

GENERAL STATEMENT

The Summer Session of the University of Illinois for 1914 will open on June 22 and close on August 14, making a term of *eight weeks*. The opening day will be devoted to registration. The final examinations will be held on Thursday and Friday of the last week.

All of the courses will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Session a certificate of such attendance, but university credit will not be given for six-weeks courses.

The number of credit-hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight credit-hours or less.

Purpose

The primary purpose of the Summer Session is to meet the needs of teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. The greater number of courses offered are designed particularly for high-school teachers, supervising officers, and teachers of special subjects (art, music, manual training, domestic science, agriculture, etc.) and for college instructors, school supervisors, and principals who are working for advanced degrees. At the same time, students who may not fall within these groups are welcomed at the Session, and several courses of a more general nature are provided to meet their needs.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the college of the University (Liberal Arts and Sciences, or Engineering, or Agriculture) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must obtain credit, either by passing entrance examinations, or by presenting certificates of work completed in accredited secondary schools or other recognized

schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

The subjects prescribed for admission to the course in liberal arts are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; foreign language, 3 units (2 units must be in the same language); history, 1 unit. Five and one-half elective units are required to make up the total of 15 units.

For the course in science in the College of Liberal Arts and Sciences, and for the College of Agriculture, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; science, 2 units. Seven and one-half elective units are required to make up the total of 15 units.

For the College of Engineering, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit; physics, 1 unit. Eight elective units are required to make up the total of 15 units.

Persons who lack not more than 2 units of the requirements for any one of the colleges as stated above, may be admitted as *conditioned students.* Conditions must in every case be removed within the first year of residence.

Admission to courses which give university credit, *as special students, not candidates for a degree,* may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

Teachers who cannot meet the above conditions may be admitted to those courses which do not carry university credit.

Registration

Students will present themselves for registration on Monday, June 22. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first consult with Dean David Kinley of the Graduate School. (Dean Kinley's office is Room 109, Commerce Building.)

All fees are due upon registration, and should be paid at the Business office, Room 323, Natural History Building.

Fees

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee is charged in some courses for materials used. Any single course may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken. A single course is understood to mean not more than two and one-half credit-hours.

Scholarships

By ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must either pass the entrance examinations, or present a certificate from an accredited high school or other evidence of having completed the requisite amount of preparatory work.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class 1914, and to persons (otherwise qualified) who have not been teachers, but who are under contract to teach in the State during the coming year.

Those who wish to take advantage of the scholarship privilege should present to the Director of the Session prior to June 1, 1914, a statement from the board of education employing them to the effect that they have either been teaching during the past year or are under contract to teach during the coming year. Normal-school graduates (Class 1914) may present either their diploma or a written statement from the President of the normal school certifying that the course has been completed.

Application-blanks for scholarships may be obtained by addressing the Director.

General Assembly

On the first Thursday of the Session, at 4 P. M., an Assembly will be held in the Chapel of University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc., and the opportunities and advantages of summer work at the University will be explained.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which are in themselves of no little value, and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

Arrangements have been made with the Ben Greet Players for a series of open-air performances.

Teachers' Conferences

The informal features of the Session will include a continuation of the conferences of teachers, superintendents, and principals. The importance of these round-table discussions in supplementing the more formal class exercises was amply demonstrated by the experience of the last Session.

Dr. L. D. Coffman, Professor of School Administration, and Dr. Charles H. Johnston, Professor of Secondary Education, will aid in organizing and conducting these conferences.

Some of the topics for discussion are:

1. The Educational Survey of Illinois.
   Professor COFFMAN.
2. The Actual and Ideal Distribution of a High-School Principal's Professional School Day.
   Professors JOHNSTON and COFFMAN.
3. A Comparative Estimate of Various Systems of Educational and Vocational Guidance. Professor JOHNSTON.

4. Various Experiments in the Pedagogy of High-School Subjects. Professor JOHNSTON.
5. Improvement of Teachers in Service.
Professors JOHNSTON and COFFMAN.
6. The Standardization of North Central High Schools.
Professor COFFMAN.

A Model and Demonstration Teachers' Institute

Plans are being made to make the Champaign and Piatt Counties Teachers' Institute, which will be held at the University during the week beginning August 3, a model and demonstration institute.

Courses in Public School Music

An important feature of this year's Session will be the introduction of courses in public-school music. These courses will be given by Assistant Professor Constance Barlow-Smith, head of the Department of Public School Music in the University School of Music.

The technical preparation of supervisors of music will receive important emphasis, but certain features of the work will also aim to meet the needs of superintendents and principals who may wish to gain an acquaintance with musical theory and methods of teaching.

Besides the course in music for the high school, a course will be offered for primary and intermediate grades.

Finally, the side of appreciation will not be neglected. Arrangements will be made to demonstrate the various methods of bringing the best music into the public schools through the medium of the Victor-Victrola.

For those who wish private instruction in voice, piano, violin, band instruments, or harmony, excellent opportunities will be provided. For further information address either Director C. H. Mills, or Mrs. Constance Barlow-Smith, of the School of Music.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the new certificating law enacted by the General Assembly, in 1913, appear the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate.
   Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate.
   Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate.
   Requirements same as for elementary school certificate except that the examination includes, in addition, sociology, history of education, school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate.
   Examination in common branches.
2. Second-grade elementary-school certificate.
   Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate.
   Examination in the common branches, three of the natural sciences, English, algebra, general history, and pedagogy.
4. High-school certificate.
   Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate.
   Examination in English, educational psychology, history of education, and administration.
6. Kindergarten-Primary certificate.
7. Special certificate.
   Examination in English and principles and methods of teaching.
8. Provisional certificate.
9. Emergency certificate.

Examinations for the *State Elementary School Certificate,* the *State Supervisory Certificate* and the *State High School Certificate* will be held at the University on July 21 and 22; *provided that at least fifteen applicants notify the State Superintendent prior to June 10, 1914, of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction indicates the new method of preparing theses:

"A thesis prepared under the direction of a teacher in normal school, college or university, either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected.

"The thesis must be filed with the Superintendent of Public Instruction before July 15, 1914."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session Courses are especially adapted to prepare for the professional examinations:

Education A, B, and C.

Education S-1a and S-1b, Principles and Methods of Teaching.

Education S-15, School Hygiene.

Education S-20 and S-16 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S-2; History of Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-1 should prepare for the examination in educational psychology.)

Education S-6; The Principles of High School Education.

Education S-104; Seminary in Educational Administration.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Manual Training

The work in manual training will be under the direction of Director Joseph C. Park, of the Department of Industrial Education, State Normal School, Oswego, New York. The work will include courses in wood-working and machine shop.

The demand for well-qualified teachers of manual training is becoming more and more insistent each year, and the University

is not now able to supply even a small fraction of the teachers of manual training that are called for by the schools of the State. The Summer work is particularly important since it is planned especially to meet the needs of teachers of manual training in the elementary and high schools.

Agriculture

The demand for teachers of agriculture in the high schools has led to an extension of the summer offerings in this subject. The courses in secondary-school agriculture are planned primarily to meet the needs of teachers of agriculture in the high schools. The courses will include a study of general agriculture adapted to secondary schools, with emphasis placed on the subject-matter of agriculture, and such reference to the methods of presentation as the needs of the class demand. The work was planned in 1912 to continue throughout four summer sessions, the course in each session to cover the work of one year of high-school agriculture. This work will be under the direction of Mr. A. W. Jamison.

Graduate Work in the Summer Session

During the past two years the Summer Session has placed increasing emphasis upon graduate courses leading to the Master's degree. The various departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid upon graduate courses in English, chemistry, economics, and education.

The normal requirements for the Master's degree is satisfactory work continued during one year of residence. This means a residence of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student, by working at the University for one week after each Session under the direction of the pro-

fessor in charge of his major subject, may earn the Master's degree in four summers.

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigations in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory." Where the investigation of such problems is prosecuted with the coöperation of a university department, it may be possible to count the work toward the Master's degree.

Summer Courses in Library Training

Beginning Monday, June 22, 1914, and continuing for six weeks, the Library School will conduct a Summer Session *to which will be admitted only those actually employed as librarians, or library assistants, or teacher-librarians, or under definite appointment to serve in such positions.* The curriculum will be planned to meet especially the needs of workers in public libraries and in high-school libraries of Illinois and no tuition fee will be charged students entering from this State; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No university credit is given for the work as offered in 1914.

The work will occupy the whole time of the student. The number of lectures in each subject will be approximately as follows: Cataloging, 20; classification and book numbers, 13; book selection, 14; administration of small libraries, 10; reference work, 10; work with children, 10; loan systems, order, accession and shelf work, binding and repair, 13.

The Library courses are not offered in connection with the Summer Session, but as an independent undertaking of the Library School.

For further information address the Director of the University of Illinois Library School, Urbana, Illinois.

Explanations of Abbreviations, Etc.

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular university year. Summer courses do not always cover the same ground as those similarly numbered in the regular session. Students wishing to know in what respect such courses are similar will be gladly furnished with the desired information upon application to the Director.

The number of credit-hours that may be earned by any course is clearly indicated in every case.

The word "daily" in the announcement of courses indicates that the class meets five times each week (M.T.W.T.F.). Certain classes meet six times a week, and a few meet twice each day for five or six days.

All courses that are granted graduate credit are marked with an asterisk (*). *Courses numbered 100 and above are open only to graduate students.*

The following abbreviations are used to designate the different buildings in which classes are held:

Ag	College of Agriculture
C	Chemical Laboratory
Com.B	Commerce Building
E.H	Engineering Hall
L.A.M	Laboratory of Applied Mechanics
L.B	Law Building
L.H	Lincoln Hall
P.L	Physics Laboratory
N.H	Natural History Building
T.B	Transportation Building
U.H	University Hall
W.H	Woman's Building

OUTLINE OF COURSES

AGRICULTURE

Mr. Jamison, Mr. Miller, Mr. Bauer, Mr. Smith, Mr. Roberts, Mr. Gardner

The work in the Summer Session of the University is planned to meet the needs of prospective teachers of agriculture in elementary and high schools.

S 1. Crop Production.—Plant growth, structure; habits and requirements for production of farm crops; seed selection; preparation of seed bed and seeding; tillage, harvesting; rotations; cost of production; purity of grain; grain judging; weeds, identification and control; diseases and control. Lectures, laboratory. M. T. W. T., 2; 128 Ag.; 2 credit-hours. Mr. Bauer.

S 2. Soils and Fertilizers.—Origin of soil materials; formation; classification; moisture; physical characteristics affecting farm operations; physical improvement of soils; systems of farming; influence of fertility upon crop yields; effect of crops upon soil and succeeding crops; rotations; manures and fertilizers, composition and value; fertility of Illinois soils. Lectures, laboratory. M. T. W. T. F., 9, 10; 128 Ag.; 2½ credit-hours. Mr. Bauer.

S 4. Fundamentals of Live Stock Judging.—The names and location of the external parts of various kinds of live stock; the use of the score card; comparative judging; breed identification and types of farm animals. A study of the methods, and a consideration of the materials available for teaching live stock judging in secondary schools. M. T. W. T. F., 9; 301 Ag.; 2½ credit-hours. Mr. Smith.

S 5. Orchard and Garden.—Principles of orcharding; the home orchard from planting to bearing; caring for fruit trees; the home vegetable garden. Lectures, recitations, and field work. M. T. W. T., 2, 3; 302 Ag.; 2 credit-hours. Mr. Gardner.

S 6. Poultry.—Types, breeds and varieties. Exhibiting, judging; poultry houses and equipment; breeding, feeding, hatching, and brooding; marketing eggs; fattening, dressing and shipping of poultry. M. T. W. T. F., 3; 301 Ag.; 2½ credit-hours. Mr. Miller.

S 7. General Agriculture.—One-year course. A general course in the elements of agriculture, designed to cover the work offered in a year's high-school course. Type studies of farm crops, fruits, animals, soils, business, and special farm problems practical for school work. Lectures, quizzes, and field work. M.T.W.T.F., 11; 309 Ag.; 2½ credit-hours. Mr. Miller.

S 8. Seminar.—Conferences and discussions on the problems of public-school agriculture; courses of study; extension activities; community work and rural education. Lectures, reference readings and round-table discussions. F., 4; 553 Ag.; ½ credit-hour. Mr. Jamison, Mr. Miller.

S 9. Genetics.—A study of the principles of heredity and variation. The course considers causes and course of evolution, reproduction, transmission of characters, causes of variation, relative effects of heredity and environment and methods of plant and animal improvement. Lectures, quiz work, assigned reading, and demonstrations. M. T. W. T., 11; 303 Ag.; 2 credit-hours. Mr. Roberts.

S 10. Farm Mechanics.—Elementary studies of farm mechanics dealing with the principles of farm machinery; equalizers and hitches; ropes, their care, use, knots and splices; purchase and care of implements for seeding, cultivating and handling of crops; concrete construction on the farm; design and construction of farm buildings. Lectures, laboratory work. M. T. W. T. F., 1, 2; 553 Ag.; 2½ credit-hours. Mr. Jamison.

S 11. Principles of Feeding Farm Animals.—The classification of feeding stuffs; calculation of rations for farm animals; digestibility and uses of food nutrients. A study of the materials available for practical exercises in secondary schools. M. T. W. T., 8; 301 Ag.; 2 credit-hours. Mr. Smith.

ART AND DESIGN

Miss Hill

S 1. Elementary.—Form drawing from still-life, cast, and nature; principles of outline and shading in pencil, charcoal, and crayon; lectures on the principles of perspective. M. T. W. T. F., 1, 2; 405 U.H.; 2 credit-hours. Miss Hill.

S 20. Art for the Common Schools.—The planning and execution of work in the several divisions of common-school art study; design; black-board drawing. Lectures upon organization, equip-

ment, and the administrative side of the supervisor's work. For supervisors of drawing, and public-school teachers. M. T. W. T. F., 3, 4; 405 U.H.; 2 credit-hours.

BOTANY

Professor Trelease, Dr. Hague.

S 2. Flowerless Plants.—A field and laboratory study of selected types, dealing with their morphology, classification and ecological relations. T. Th., 2-5; S., 8-12; 306 N.H.; 2½ credit-hours. Dr. Hague.

Prerequisite: Entrance botany or Botany 1 or 11.

S 4. Flowering Plants.—A study of the local flora, chiefly in the field, dealing with morphology, organography, naming, classification and ecology. M. T. W., 8-12; 304 N.H.; 3 credit-hours. Professor Trelease.

Prerequisite: Entrance botany or Botany 1 or 11.

*S 16. Lower Plants.—Field, laboratory and herbarium work and assigned reading, on special groups. 306 N. H.; time and credit to be arranged. Dr. Hague.

Prerequisite: Ten hours of botany and junior standing.

*S 17. Higher Plants.—Field work, with assigned reading, on subjects such as special morphology, vegetative ecology, pollination and seed dispersal, with thesis. M. T. W., 8; start from 304 N. H. Professor Trelease.

Prerequisite: Ten hours of botany and junior standing.

CHEMISTRY

Professor Balke, Assistant Professors Derick and Weber, Dr. MacInnes, Dr. Beal, Dr. Hopkins, Mr. Sears, Mr. Kamm.

Note: With the exception of course S 32, all of the courses in chemistry offered in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

Graduate Work.—The courses which are starred (*) below are accepted for graduate credit in accordance with the introductory paragraphs of the Graduate School Circular under the head of Chemistry.

S 1. Elementary Chemistry.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements; the course consists of illustrated lectures, recita-

tions, and laboratory work. Text: Noyes' *Text Book of Chemistry,* (Henry Holt and Company). Lecture—Quiz, M. T. W. T. F. S., 11; Laboratory, M. T. W. T. F. S., 8, 9, or 9, 10; 321 Chemistry Building; 5 credit-hours. Professor BALKE, Dr. HOPKINS, Mr. SEARS.

S 1a and S 1b. INORGANIC CHEMISTRY.—For students who have had one year of high-school chemistry, or inorganic chemistry for engineering students. These courses may be taken at the same hours as Chemistry S 1, but only half the laboratory time indicated for S 1 is required. 321 Chemistry Building; 4 credit-hours.

Professor BALKE, Dr. HOPKINS, Mr. SEARS.

S 2. DESCRIPTIVE INORGANIC CHEMISTRY.—A continuation of S 1 and is devoted mainly to the study of the metallic elements, their compounds, and properties; the course consists of illustrated lectures and recitations, but does not include laboratory work. Text: Noyes' *Text Book of Chemistry,* (Henry Holt and Company). M.T. W. T. F., 8; 321 Chemistry Building; 2 credit-hours.

Professor BALKE.

Prerequisite: Chemistry 1.

S 3. QUALITATIVE ANALYSIS.—Lectures, recitations, and laboratory practice in the ordinary processes of qualitative analysis, Noyes and Smith's *Qualitative Analysis,* (Henry Holt & Company.) Lecture, T. T. S., 9; Laboratory, M.T.W.T.F.S., 10, 11; 319 Chemistry Building; 3 credit-hours. Assistant Professor WEBER.

Prerequisite: Chemistry 1.

*S 5a. ELEMENTARY QUANTITATIVE ANALYSIS.—The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods; the lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis,* (The Macmillan Company). M.T.W.T.F., 8-12; 208 Chemistry Building; 5 credit-hours. Dr. BEAL.

Prerequisite: Chemistry 1 and 3.

*S 5c. FOOD ANALYSIS.—Quantitative organic analysis, with special reference to the examination of food and drug products: alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis* (The Macmillan Company). *"Bulletin 107, rev., U. S.*

Bureau of Chemistry." M.T.W.T.F., 8-12; 208 Chemistry Building; 5 credit-hours. Dr. BEAL.

*S 9a.—ORGANIC SYNTHESIS.—This course consists of the preparation of the typical compounds discussed in S 14. Text: Noyes' *Organic Chemistry for the Laboratory,* (Chemical Publishing Company.) M.T.W.T.F., 9-12; 213 Chemistry Building; 2 credit-hours. Assistant Professor DERICK, Mr. KAMM.

Prerequisite: Registration in S 14 (First Semester).

*S 9b. ORGANIC SYNTHESIS.—Continuation of S 9a. Text: Noyes' *Organic Chemistry for the Laboratory.* M.T.W.T.F., 9, 10, 11; 213 Chemistry Building; 2 credit-hours.

Assistant Professor DERICK, Mr. KAMM.

Prerequisite: S 9a and registration in S 14 (Second Semester).

*S 14. ORGANIC CHEMISTRY (First Semester).— A discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideration of most of the important classes of derivatives of carbon. This course may be substituted for Chemistry 9 of the academic year. M.T.W.T.F.S., 8; 213 Chemistry Building; 3 credit-hours. Assistant Professor DERICK, Mr. KAMM.

Prerequisite: Chemistry 2 and 3.

*S 14. ORGANIC CHEMISTRY (Second Semester).—Lectures and recitations. Noyes' *Organic Chemistry,* (Henry Holt and Company). Daily, arrange; 213 Chemistry Building; 3 credit-hours.

Assistant Professor DERICK.

Prerequisite: Chemistry S-14 (First Semester) or equivalent.

S 11 and *S 111. RESEARCH.—Opportunity will be given for advanced work and research in inorganic, physical, organic or analytical chemistry. Arrange.

Professor BALKE, Assistant Professors DERICK and WEBER, Dr. MACINNES, Dr. BEAL.

(Subject to approval of Graduate School Faculty.)

*S 13a. AGRICULTURAL ANALYSIS.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Talbot's *Quantitative Chemical Analysis,* (The Macmillan Company). (For students in Agriculture.) M.T.W.T.F., 8-12; 208 Chemistry Building; 5 credit-hours. Dr. BEAL.

S 17. TEACHERS' COURSE.—A study of the methods which may be followed in teaching *elementary chemistry,* and a review of the

fundamental principles of the science. Arrange; 321 Chemistry Building; 1 credit-hour. Professor Balke.

Prerequisite: One year's work in chemistry.

*S 31. Elementary Physical Chemistry.—Some of the more important principles and methods of physical chemistry and electrochemistry; numerous problems. Lectures; recitations. M.T.W.T.F., 8; 122 Chemistry Building; 3 credit-hours. Dr. MacInnes.

Prerequisite: Chemistry 1, 2, 3; Physics 1 or 2a; Mathematics 8a.

Teachers who have not had calculus will register for S 32.

*S 33. Elementary Physical Chemistry.—Molecular weight of gases and solutions; chemical equilibrium; the electrical conductivity of solutions and the attendant phenomena within the solution; thermochemistry. (Laboratory to accompany course 31.) M. T.W.T., 1-4; 128 Chemistry Building; 2 credit-hours.

Dr. MacInnes.

Prerequisite: Chemistry 5a; Physics 26 or 3.

GENERAL ENGINEERING DRAWING

Mr. Jordan

S 1. Elements of Drafting.—Required of all engineering students; consists of freehand and mechanical lettering; practice in the use of instruments on standard set of working drawing plates; tracing, machine sketching, isometric and oblique projection, and perspective. Text: Miller's *Mechanical Drafting.* Daily, 8-11; 303 Transportation Building; 4 credit-hours. Mr. Jordan.

S 2. Descriptive Geometry.—Problems relating to the point, line, and plane; the properties of surfaces; intersections and developments of surfaces. Text: Miller's *Descriptive Geometry.* Daily, 8-11; 303 Transportation Building; 4 credit-hours. Mr. Jordan.

ECONOMICS

Professor Carlton, Assistant Professor Litman, Dr. C. M. Thompson

S 2. Principles of Economics.—This is a survey of the general principles of economics, with special reference to the needs of teachers, general readers and university students. Advanced stud-

ents of the University who wish to anticipate Economics 2 may do so by taking this course; but under no circumstances will it be accepted as part fulfillment of Economics 1. M.T.W.T.F., section A, 10; 101 Com. B.; section B, 11; 101 Com. B.; 2 credit-hours.

Dr. C. M. THOMPSON.

Prerequisite: For university students at least 60 hours of university credit; for teachers and other mature students, enrolled for the Summer Session only, the permission of the instructor.

*S 12. HISTORY AND PROBLEMS OF ORGANIZED LABOR.—A study of the history, aims, ideals, methods, structure and problems of American labor organizations. M.T.W.T.F., 9; 206 Com. B.; 2½ credit-hours. Professor CARLTON.

Prerequisite: Senior or graduate standing and eight hours in economics.

S 22. INDUSTRIAL HISTORY OF THE UNITED STATES.—A brief study of industrial evolution in the United States from the simple colonial economy to the complex industrial organization of the twentieth century. M.T.W.T.F., 8; 204 Com. B.; 2½ credit-hours.

Professor CARLTON.

S 27. RESOURCES AND INDUSTRIES.—This course deals with the resources and the industrial development of different countries, tracing the effects of environment and other factors upon economic activities; a review is made of various extractive, cultivating and manufacturing industries, discussing their nature, present status and importance in the world's trade. M.T.W.T.F., 9; 204 Com. B.; 2½ credit-hours. Assistant Professor LITMAN.

S 28. DOMESTIC AND FOREIGN COMMERCE.—Marketing methods used by manufacturing and by mercantile concerns; wholesale and retail trade organizations; commercial competition; mercantile credit; problems arising in connection with the purchase and sale of commodities in foreign countries. M.T.W.T.F., 10; 206 Com. B.; 2½ credit-hours. Assistant Professor LITMAN.

Prerequisite: This course is open (1) to teachers of commercial subjects, and (2) to others who have two years of university credit including Economics 1 and 3, or the equivalent.

EDUCATION AND PSYCHOLOGY

Professors Bagley, Coffman, Johnston; Assistant Professor Anderson; Dr. Rapeer; Messrs. Miller, Harlan and Hall-Quest.

Note: The prerequisites as stated in connection with the following courses may, in the discretion of the instructor in charge of each course, be modified in their application to *teachers* who may desire to enroll in the courses in question.

Teachers who do not wish to matriculate in the University or who cannot enroll as conditioned or as special students may register in the Summer Session for courses *not carrying university credit.* A list of such courses, offered in education and psychology, will be found at the close of the following departmental announcement. One course of a similar character will also be found in the list offered by the Department of English.

COURSES FOR UNDERGRADUATES

S 1a. Principles of Education.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; the problem of educational values. Text: Bagley's *Educative Process.* (Macmillan). T.W.T.F., 8; 206 U.H.; 2 credit-hours. Mr. Miller.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet this requirement).

Equivalent: With Education S 1b, this course is equivalent to Education 1 as offered during the university year.

S 1b. The Educational System.—A brief survey of the school system of the United States, its present organization, its origin, its distinctive characteristics as compared with other systems, and the more important of its present problems. Lectures and readings. M.T., 3; 202 L.H.; 1 credit-hour. Professor Bagley.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet the requirement).

Equivalent: With Education S 1a, this course is equivalent to Education 1.

S 2. History of Education.—The development of educational theory and practice in their relation to the history of civilization. Text: Monroe's *History of Education: Brief Course.* M.T.W.T.F.,11; 113 L.H.; 2½ credit-hours. Assistant Professor Anderson.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet the requirement).

Equivalent: Education 2 (in part).

S 15. School Hygiene.—The location and construction of school buildings; the hygiene of lighting, heating, and ventilation; school furniture; the hygiene of eyesight and hearing; fatigue; physical defects; communicable diseases. Provision will be made for initial training in the application of tests and diagnostic methods. Texts: Terman's *Hygiene of the School Child* (Houghton-Mifflin); Dresslar's *School Hygiene* (Macmillan). T.W.T.F., 1; 113 L.H.; 2 credit-hours. Dr. Rapeer.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet this requirement).

Equivalent: Education 15.

S 16. Social Aspects of Education.—The need of a social point of view in education; social agencies and social forces in relation to the school; the refractive power of the school; the school as a determinant of public opinion. Readings, lectures, and discussions. M.T.W.T., 9; 113 L.H.; 2 credit-hours.

Professor Coffman.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet the requirement).

S 25. Educational Psychology.—The biological interpretation of the learning process; the problem of heredity in its relation to mental development; the psychology of habit with especial reference to the investigations concerning the acquisition of skill; experimental studies in memory and association; the transfer of training and the doctrine of formal discipline; recent investigations of the higher thought processes. Text: Colvin's *Learning Process* (Macmillan). T.W.T.F., 2; 206 U.H.; 2 credit-hours. Mr. Miller.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet this requirement).

Equivalent: Education 25 (in part).

COURSES FOR GRADUATES AND ADVANCED UNDERGRADUATES

*S 6. The Principles of High-School Education.—A study of the evolution of high schools and of the fundamental conceptions of secondary education; the relationships of the high school to the state system; its legal status; its articulation with the elementary school, with the college, with the technical schools, with the com-

munity and with the home. Typical problems to be considered are the teaching staff, reorganization of curriculums, "controls" of construction, direction of student activities and the administration of vocational and moral guidance, school journalism, debating activities, athletics, high-school hygiene, etc. M.W.T.F., 10; 202 L.H.; 2 credit-hours; ½ graduate unit. Professor JOHNSTON.

Prerequisite: Education 1, or equivalent. (High-school teachers and principals may in the discretion of the instructor be admitted to the course without reference to this prerequisite.

Equivalent: Education 6 (in part).

*S 13. EDUCATIONAL CLASSICS.—A critical and comparative study of the works on education generally recognized as classics. Each work is studied in the light of the conditions amidst which it was produced. The educational writings of Plato, Aristotle, Quintilian, Montaigne, Milton, Locke, Rousseau, Pestalozzi, Herbart, Froebel, Spencer, and others. M.T.T.F., 10; 103 L.H.; 2 credit-hours; ½ graduate unit. Assistant Professor ANDERSON.

Prerequisite: Education 2 (History of Education) or equivalent.

Equivalent: Education 13 (in part).

*S 20. SUPERVISION.—A course for principals, superintendents, and supervisors. The limitations, types, functions, standards, and devices of supervision; the use of objective scales in measuring the efficiency of teaching; the qualifications of teachers; methods of rating teachers. Lectures, readings, and the investigation of special problems. M.T.W.T., 8; 113 L.H.; 2 credit-hours; ½ graduate unit. Professor COFFMAN.

Prerequisite: Education 1 or equivalent. (Superintendents, principals, and supervisors may in the discretion of the instructor be admitted to the course without reference to the prerequisite.)

Equivalent: Education 20a (in part).

*S 27. HIGH-SCHOOL CURRICULUMS.—A study of the fundamental bases upon which high-school curriculums should be constructed, the principles of professional supervision, the materials, text books and other teaching devices provided for modern secondary-school work, and special treatment of the psychology of the mental processes involved in selected high-school branches of study. The latter part of the course will be concerned with the framing of

differentiated curriculums for typical cities and communities. M.W. T.F., 11; 202 L.H.; 2 credit-hours; ½ graduate unit.

Professor JOHNSTON.

Prerequisite: Education 1 or equivalent. (In the discretion of the instructor this course is open to high-school teachers and principals and superintendents without reference to this requirement).

Equivalent: Education 27 (in part).

*S 28. SCHOOL HEALTH ADMINISTRATION.—The problem of health administration from the point of view of the school superintendent; typical forms of school health administration; school sanitation; medical inspection; dental inspection; the school physician and the school nurse; health records and reports. Lectures, readings, and reports. T.W.T.F., 2; 113 L.H.; 2 credit-hours; ½ graduate unit (subject to approval of Executive Faculty of Graduate School).

Dr. RAPEER.

Prerequisite: Education 15 or equivalent preparation satisfactory to the instructor.

COURSES FOR GRADUATES

*S 101. SEMINARY IN EDUCATIONAL THEORY.—The topic of educational values will be discussed with particular reference to the determination of "minimal essentials" in elementary and secondary programs. M., 4-6; 103 L.H.; ¼ graduate unit (subject to approval of Executive Faculty of Graduate School).

Professor BAGLEY.

Prerequisite: Graduate standing and at least one course in the principles of education.

*S 104. SEMINARY IN SCHOOL ADMINISTRATION.—The interpretation of present tendencies as exemplified in the school systems of typical states and cities, and in recent experiments, investigations, and surveys. Readings, reports, and the investigation of special problems. Tu., 4-6; 103 L.H.; ¼ graduate unit.

Professor COFFMAN.

Prerequisite: Graduate standing.

Equivalent: Education 4 (in part).

*S 125. ADVANCED EDUCATIONAL PSYCHOLOGY.—A study of the monographic literature, dealing chiefly with the following fields: instinct; habit and the acquisition of skill; memory and association. Th. 4-6; 103 L.H.; ¼ graduate unit. Dr. RAPEER.

Prerequisite: Graduate standing and at least one course in general educational psychology.

Equivalent: Education 125 (in part).

*S 141. Seminary in Secondary Education with Especial Emphasis Upon Vocational Problems.—A survey of the field of vocational education including professional, polytechnic, commercial, industrial (or trade) and agricultural education and the household arts. The method of the seminary will be general supervision of special investigations by students prepared to do advanced work. W., 4-6; 103 L.H.; ¼ graduate unit. Professor Johnston.

Prerequisite: Graduate standing.

COURSES NOT CARRYING UNIVERSITY CREDIT

A. Principles of Teaching.—An elementary course involving a discussion of the aim of education, the function of the school, types of school exercises (drill lessons, developmental lessons, lessons for appreciation, review lessons, study and recitation lessons), the art of questioning, class management, and the elementary principles of school hygiene. M.T.W.T.F., 8; 202 L.H.; *No university credit.* Mr. Hall-Quest.

B. Elementary Educational Psychology.—The meaning of "learning"; experience and heredity in their relation to the problem of learning; the nature and classification of instincts; the nature of habit and the laws of habit-formation; the principles of sensation and perception with especial reference to their educational applications; memory and its laws; imagination and the higher thought processes. M.T.W.T.F., 9; 202 L.H. *No university credit.*

Mr. Harlan.

C. Methods of Teaching in the Elementary School.—A course offered by various members of the teaching staff, and consisting of forty lectures on the teaching of the principal subjects of the elementary program. M.T.W.T.F., 10; 410 U.H. *No university credit.* The tentative distribution of the lectures is as follows:

The Teaching of Reading (four lectures). Professor Coffman.

The Teaching of Geography (five lectures). Professor Cushing.

The Teaching of Literature (five lectures).

Assistant Professor Paul.

The Teaching of Music (three lectures).

Assistant Professor Smith.

Manual Training and Handwork in the grades (two lectures). Professor PARK.

The Teaching of Arithmetic (five lectures). Mr. MILLER.

The Teaching of History and Civics (five lectures). Professor BAGLEY.

The Teaching of Drawing (three lectures). Miss HILL.

The Teaching of Composition and Language (five lectures). Mr. HALL-QUEST.

ENGLISH

Professor DODGE, Assistant Professor PAUL, Assistant Professor COOPER, Mr. GUILD, Dr. CREEK, Dr. TIEJE, Mr. BUCHEN.

A.—LITERATURE AND LANGUAGE

S A. PREPARATION FOR THE STATE EXAMINATION IN ENGLISH.—The material to be covered in this course will be largely determined by the personnel of those registered; emphasis will be laid, however, on nineteenth century literature, the laws of versification, and the principles of composition as taught in secondary schools. (For other subjects pertinent to the examination, see courses S 1a, S 15, and S 16.) M.T.W.T.F.S., 10; 302 U.H. *No university credit.* Dr. TIEJE.

S 1a. SURVEY OF ENGLISH LITERATURE.—From Chaucer to Milton. Lectures, readings, and conferences, covering the period between the Middle English era and the Restoration. Text: *Century Readings in English Literature* (Part 1). M.T.T.F., 9; 307 U.H.; 2 credit-hours. Dr. CREEK.

Prerequisite: Entrance credit in English.

Equivalent: English 1. (Together with S 1b this course covers the work of the first half of English 1. To be credited as equivalent, the two courses, S 1a and S 1b, should be taken simultaneously).

S 1b. SURVEY OF ENGLISH LITERATURE.—From Dryden to Burns. Lectures, readings and conferences, covering the periods between the Restoration and the end of the eighteenth century. Text: *Century Readings in English Literature* (Part 1). M.T.T.F., 2; 307 U.H.; 2 credit-hours. Mr. BUCHEN.

Prerequisite: Entrance credit in English.

Equivalent: English 1. (See note under S 1a.)

S 16. AMERICAN LITERATURE.—Bryant, Irving, Cooper, Hawthorne, Emerson, Poe, Longfellow, Whittier, Lowell. Lectures, dis-

cussions, readings, and reports. Text: Page's *Chief American Poets*. M.T.W.T., 1; 202 L.H.; 2 credit-hours.

Assistant Professor PAUL.

Prerequisite: One year of college English or an equivalent.

Equivalent: English 16 (in part).

S 17. THE ENGLISH LANGUAGE.—Some account of its history, and its relations to other languages, with special reference to the characteristics and usage of modern English. Text: Emerson's *Brief History of the English Language* (Macmillan). M.T.W.T., 10; 110 L.H.; 2 credit-hours. Professor DODGE.

Prerequisite: One year of college English or an equivalent.

Equivalent: English 17.

*S 5. SHAKESPEARE.—Intensive study of selected plays, with special emphasis on *Hamlet*. Lectures and discussions. Text: Neilson's Shakespeare (Cambridge Poets). M.T.W.T., 9; 110 L.H.; 2 credit-hours. Professor DODGE.

Prerequisite: Two years of college work or an equivalent.

Equivalent: English 5 (in part).

*S 45. MODERN DRAMA.—Significant movements and plays of the nineteenth century, including some study of continental drama in translation. About twenty plays are read. Lectures and discussions. T.W.T.F., 8; 218 L.H.; 2 credit-hours. Mr. GUILD.

Prerequisite: Two years of college work or an equivalent.

Equivalent: English 45 (second semester).

S 15. ENGLISH FOR TEACHERS.—An introduction to the study of literature and of fine art in general; modern literature in relation to the ancient classics; literary types; the problem of teaching literature; the problem of teaching composition; private reading and study on the part of teachers; the library of the teacher of English. Lectures, readings, and discussions. M.T.W.T.F., 8; 110 L.H.; 2½ credit-hours. Assistant Professor COOPER.

Prerequisite: The consent of the instructor.

*S 3. INTRODUCTION TO MILTON.—A general course; preliminary reading, followed by a careful study of selections. Lectures, discussions, and original investigations. Text: *The Oxford Milton*. M.T.W.T.F., 10; 218 L.H.; 2½ credit-hours.

Assistant Professor COOPER.

Prerequisite: Two years of college English or an equivalent.

Equivalent: English 3 (in part).

*S 110. Old English (Anglo-Saxon) Poetry.—Readings and individual investigations. T.T., 11; 110 L.H. Professor Dodge.

Prerequisite: English 8 or a similar introductory course in Old English.

*S 136. The Rise of Classicism.—The beginnings of classicism in Italy, France and England; its development in England between 1660 and 1726. Lectures, readings, investigation of assigned topics. M.T.W.T., 2; 218 L.H. Assistant Professor Paul.

Prerequisite: Graduate standing or the permission of the instructor.

B.—RHETORIC

S 1a. Rhetoric and Themes.—Review of the principles of structure; grammar; punctuation; the sentence; the reasoning processes. Two short themes a week and an occasional long theme. Oral and written exercises. Texts: Woolley's *Handbook of Composition* and Scott and Denney's *Paragraph Writing*. M.T.W.T.F.S., 11; 307 U.H.; 3 credit-hours. Mr. Buchen.

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1 (first semester).

S 1b. Rhetoric and Themes.—Argumentation, narration, and description. Two short themes a week, with one or two long briefs and long arguments. Oral and written exercises. Text: Scott and Denney's *Paragraph Writing*. M.T.W.T.F.S., 11; 308 U.H.; 3 credit-hours. Dr. Creek.

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1 (second semester).

S 18. Oral English.—Oral interpretation as an aid in the study and teaching of English; some consideration of oral composition, school dramatics, and other problems of the teacher. M.T.W.T.F., 9; 218 L.H.; 2 credit-hours. Mr. Guild.

Prerequisite: The consent of the instructor.

S 20. Advanced Composition.—Themes of some length, and, in general, of serious expository character. Text: Steeves and Ristine's *Representative Essays in Modern Thought* (Macmillan). M.T.T.F., 11; 302 U.H.; 2 credit-hours. Dr. Tieje.

Prerequisite: The consent of the instructor.

ENTOMOLOGY

Assistant Professor Folsom, Mr. Peterson

S 1. General Field and Laboratory Course.—Planned to meet the needs of high-school teachers. Covers the most essential facts of entomology, emphasizing those of economic importance. Lectures, laboratory studies, and field observations. Text: Folsom's *Entomology with Reference to its Biological and Economic Aspects.* (Blakiston). T.W.T.F., 1, 2; 405 N.H.; 2 credit-hours.

Assistant Professor Folsom.

*S 2. Advanced Course.—Instruction in several lines of advanced entomological study to meet the purposes of the individual student. Arrange; 405 N. H.; 2 or 3 credit-hours.

Assistant Professor Folsom.

S 3. Economic Entomology.—In the laboratory the student learns to recognize our common injurious insects in all their stages of development; in the field he gains a personal knowledge of their injurious activities. The lectures summarize the important facts relating to each insect pest, with special consideration of the most approved methods of control. M.T.W.T.F., 1, 2, and two additional hours; 408 N.H.; 3 credit-hours. Assistant Professor Folsom.

Equivalent: Entomology 4.

*S 4. Advanced Economic Entomology.—Personal work under direction on assigned problems in economic entomology, to prepare advanced students for immediate service as state and government entomologists. Those taking this course will be associated with the current operations of the State Entomologist's Office in a way to give them the advantage of practical experience in the economic field. Arrange; Ent. Building; 3 credit-hours.

Professor Forbes, Assistant Professor Folsom.

Prerequisite: 15 hours' credit in general and economic entomology.

Equivalent: Entomology 14.

FRENCH

Professor Oliver, Mr. Carry

S 1. Elementary Course.—Pronunciation, grammar, composition, reading of easy texts. Giese's *Graded French Method* (Henry Holt & Co.) will be the introductory textbook. M., 11; T.W.T.F., 8, 11; 211 L.H.; 4 credit-hours. Mr. Carry.

Equivalent: French 1 (Elementary French, first semester).

S 1a. Elementary Course (continued). Open to capable students by special arrangement with the instructor. 2-4 credit-hours. Professor Oliver and Mr. Carry.

Prerequisite: French 1 (Elementary French, first semester), S 1, or one year of high-school French.

Equivalent: French 1, second semester (in part or full credit).

S 2. Reading of Modern French.—Rapid reading of modern authors, composition, conversation. Texts: Comfort's *French Prose Composition;* Loti's *Pêcheur d'Islande;* Lesage's *Gil Blas;* Erckman-Chatrian's *Le Juif Polonais;* Bazin's *Les Oberlé;* Hugo's *Ruy Blas;* Rostand's *Cyrano de Bergerac.* M.T.W.T.F., 8; 117 L.H.; 2 credit-hours. Professor Oliver.

Prerequisite: One year of university French or its equivalent.

NOTE. Students securing a grade of 85 or more who desire to earn an additional two credit-hours so as to make this course the equivalent of French 2 first semester of the regular university course, may do so upon approval of the instructor and by fulfilling additional requirements of assigned work. Such additional credit must, however, be indicated at the time of registration.

S 4. Composition and Conversation.—Practice in speaking and writing simple French. Talks by the instructor in French on the life and customs of the French people. As a basis for conversation Talbot's *Le Francais et sa patrie* (Benj. H. Sanborn, publishers) will be used. M.W., 10; 117 L.H.; 1 credit-hour. Mr. Carry.

Prerequisite: The approval of the instructor. A good knowledge of French grammar and an ability to read ordinary French prose will be the basis of his judgment.

S 24. Moliere.—The life and times of Molière. Careful study and interpretation of his greater masterpieces. Lectures with collateral reading and essays. T.T., 2; 211 L.H.; 1 credit-hour, or more by arrangement at registration. Professor Oliver.

Prerequisite: Two years of university French or an equivalent.

S 100. Seminar. An opportunity for graduate work will be afforded for properly qualified students. Professor Oliver.

GERMAN

Professor Lessing, Dr. Koller, Dr. Barto, Mr. Held

S 1. Beginners' Course.—Section A; M., 9; T.W.T.F., 8, 9; 205 L.H.; section B; M., 10; T.W.T.F., 10, 11; 211 L.H.; 4 credit-

hours. Text: Gohdes and Buschek's *Sprach-und Lesebuch,* Henry Holt & Co. *Equivalent*: German 1.

Dr. Koller, Mr. Held.

S 2. Intermediate Course.—(Open to those who have had German 1 of the regular university year or an equivalent.) M.T.W.T.F.S., 10; 207 U.H.; 3 credit-hours. *Equivalent*: German 3 (in part). Dr. Barto.

S 3. Prose Reading.—Narrative prose; sight translation; composition. (Open to those who have had German 3 of the regular university year or an equivalent.) M.T.W.T.F.S., 11; 207 U.H.; 3 credit-hours. *Equivalent*: German 4 (in part). Dr. Barto.

S 4. Readings from the Classics.—Lessing's *Minna von Barnhelm,* Schiller's *Jungfrau von Orleans.* (Open to those who have had German 4 of the regular university year or an equivalent.) M.T.W.T.F.S., 9; 205 L.H.; 3 credit-hours. *Equivalent*: German 5 (in part). Professor Lessing.

S 5. Prose Composition and Conversation.—Translation of ordinary prose into German; study of idiomatic constructions; practice in free composition and conversation. *Prerequisite*: two years of university German or an equivalent. M.W., 9; 211 L.H.; 1 credit-hour. Text: *Pope's Composition,* H. Holt & Co. *Equivalent*: German 16 (in part). Mr. Held.

S 9. Teachers' Course.—Place, aim, and scope of the study of German in the high school; discussion of methods and the chief difficulties in teaching German. Observation work in the beginners' course. (Open to those who have taught German or to those who have had three years of university German or an equivalent.) T.T., 10; 215 L.H.; 1 credit-hour. *Equivalent*: German 25 (in part.) Dr. Koller.

*S 11. History of German Literature from Klopstock to Keller (i. e., from about 1750 to 1890.)—Discussions, reports on assigned topics, reading of the most important works. *Prerequisite*: three years of university German or an equivalent; (open also to graduate students.) M.W.F.S., 8; 205 L.H.; 2 credit-hours. *Equivalent*: German 11 (in part) Professor Lessing.

HISTORY

Professor Moran, Professor Richardson, Assistant Professor Robertson

S 1c. History of Europe since 1648.—An introductory course corresponding, for the period covered, to History 1, as given during the regular university session. M.T.W.T.F., 8; 311 L.H.; 2½ credit-hours. Professor Richardson.

S 3a. American History, 1606-1783.—Colonization; the colonies in the eighteenth century; the conflict of France and England for the possession of North America; the American Revolution. M.T.W.T.F., 9; 305 L.H.; 2½ credit-hours.

Assistant Professor Robertson.

Courses for Graduates and Undergraduates

(At least junior standing required)

*S 4. The Modern Constitutional History of England.—M.T.W.T.F., 11; 305 L.H.; 2½ credit-hours. Professor Moran.

Prerequisite: At least one year of college work in European or English history.

*S 30. The United States and Latin America.—Among the topics considered will be the following: The liberation of the Spanish-American colonies and the independence of Brazil; the recognition of these states as independent nations; the Monroe Doctrine, its origin, application, and influence; Pan-Americanism; intervention in Spanish America; the Panama Canal. M.W.F., 8; 305 L.H.; 1½ credit-hours. Assistant Professor Robertson.

Prerequisite: At least one college course in American history.

*S 31. Intellectual Background of Medieval Institutions.—This course is concerned with the ancient origins, and nature, of that attitude toward God and the world which forms the intellectual basis for the most characteristic institutions of the Middle Ages. The course will involve a study, in translation, of Augustine's *City of God* and perhaps Dante's *De Monarchia.* Attention will be devoted to the fate of classical literature, and to one or two types of medieval literature. M.T.W.T., 2; 311 L.H.; 2½ credit-hours. Professor Richardson.

Prerequisite: A college course in medieval history. Open also by permission of the instructor to advanced students in classics and modern languages.

COURSES FOR GRADUATES.

*S 101. INVESTIGATION OF SELECTED TOPICS.—Conferences with graduate students who desire guidance in research. Arrange.
Assistant Professor ROBERTSON.

HOUSEHOLD SCIENCE

Miss ANNA WILLIAMS, Miss PARSONS, Miss FLEMING

FOODS.—The work offered in foods is of two grades. A. That designed for those who have studied or taught household science and wish to prepare themselves to teach it in high schools. B. Advanced work dealing with the general subject of nutrition.

S 1. A study of the sources and cost of foods, the cooking of various types of foods, and the combinations of food as shown in planning and service of meals. Text: Bevier and Van Meter's *Selection and Preparation of Food.* Reference work in addition. Laboratory, M.W.F., 10, 11; Lecture, Tu., 10; Quiz, Th., 10; W.H.; 1½ credit-hours. Laboratory Fee, $2.00. Miss WILLIAMS.

S 2. A study of the relative nutritive value of foods; the methods of estimating dietetic values; the relation of foods to the human body. Laboratory, T.Th., 8, 9; Lecture, M., 8; Quiz, W.F., 8; W.H.; 1½ credit-hours. Laboratory Fee, $2.00. Miss WILLIAMS.

Prerequisite: A year's work of college rank with foods; a year of general chemistry; a course in general physiology.

S 3. LUNCH ROOM MANAGEMENT.—Designed to prepare students to take charge of lunch rooms. It aims to make the student familiar with the history of the movement to feed school children, and also to give her the practice in lunch room management which is essential to such work. Three three-hour periods per week. Arrange time. W.H.; 1½ credit-hours. Laboratory Fee, $3.00.
Miss PARSONS.

Prerequisite: Work equivalent to a year's training in food principles; practical experience in house management and marketing.

S 4. CLOTHING.—A study of the textiles used in clothing; discussion of the cost and care of clothing; demonstrations in the use of patterns; drafting; laboratory work in the making of undergarments, a shirtwaist, and a cotton dress. Lecture and discussion, M., 2; Laboratory and demonstration, W. F., 1, 2, 3; W.H.; 1 credit-hour. Miss FLEMING.

S 5. MILLINERY.—Demonstrations and laboratory work in the designing and construction of wire, buckram, and cape net frames;

the covering with velvet and straw. Demonstrations and laboratory, T.Th., 1, 2, 3; W.H.; 1 credit-hour. Miss Fleming.

CLASSICAL DEPARTMENT

LATIN

Professor Barton, Assistant Professor Canter

S 1. Plautus.—Three plays will be read with brief discussion of the language and verse of comedy. For those who have had three or four years of high-school Latin. M.T.W.T., 8; 114 L.H.; 2 credit-hours. Assistant Professor Canter.

S 2. The Roman Historians.—Selections will be read from Sallust, Livy, Tacitus, and Suetonius, illustrating the aims and methods of each in the field of historical writing. For those who have had two or three years of college Latin or the equivalent. T.T. S., 9; 114 L.H.; 1½ credit-hours. Assistant Professor Canter.

S 3. The Private Life of the Romans.—The house, marriage, dress, education, and amusements will be considered. Lectures and assigned readings. The lantern will be used to illustrate the subjects discussed. M., 3; 120 L.H.; ½ credit-hour.

Professor Barton.

S 4. Teachers' Course.—Special attention to the problems and methods of instruction in Latin in the secondary schools; the essentials of Latin study in the first and second years; books and equipment. The slides and photographs of the Classical Department and the Classical Museum will be at the disposal of the class. T.T.S., 3; 120 L.H.; 1½ credit-hours. Professor Barton.

COURSE FOR GRADUATES AND ADVANCED UNDERGRADUATES

*S 5. Roman Satire.—Lectures and discussions on the origin and history of satire as a department of literature; readings from Horace, Juvenal, Persius, and Petronius. Arrange. 1½ credit-hours. Assistant Professor Canter.

MANUAL TRAINING

Mr. Park, Advisor; Mr. Gross, Mr. Jordan, Mr. Radebaugh,

The courses in Manual Arts have been arranged to satisfy the needs of three classes of students who attend the Summer Sessions;

first, superintendents, principals, and teachers in small schools who pursue the work with the idea of either teaching or supervising it in their schools; second, manual arts teachers and supervisors who take the courses to increase their knowledge and experience, thus enabling them to command higher salaries; and, third, to satisfy those students in other courses who take the work to enrich their experiences.

S 1. Industrial Education.—History and theory of industrial education; a study of typical schools and systems of manual arts, leading to a better understanding of the aims and methods of various schemes for the promotion of industrial education in this country and European countries; organization of work; and, a study of equipments and materials. Daily, 8; Lecture Room, Wood Shops; 2½ credit-hours. Mr. Park.

S 2. Woodworking.—(A course for teachers in the 7th and 8th Grades and high schools.) Includes a study of tools—as uses, names of parts, adjustments, care of, and how to sharpen; the making of important joints used in wood construction and the application of these joints to the making of useful and interesting projects; the designing and making of arts and crafts furniture; notebook work, covering talks, papers, problems, etc.; strenuous work at the bench. Daily, 2, 3, 4; Wood Shop; 3 credit-hours.
Mr. Park and Mr. Gross.

S 3. Woodworking.—(A course for teachers who have completed S 2). Advanced work in cabinet making; designing and making furniture; technology of woodworking; also, some work in wood turning. Daily 9, 10, 11; Wood Shop; 3 credit-hours.
Mr. Park and Mr. Gross.

S 4. Elements of Drafting.—Required of all engineering students; consists of freehand and mechanical lettering; practice in the use of instruments on standard set of working drawing plates; tracing, machine sketching, isometric and oblique projection, and perspective. Text: Miller's *Mechanical Drafting*. Daily, 8-11; 303 Transportation Building; 4 credit-hours. Mr. Jordan.

S 5. Descriptive Geometry.—Problems relating to the point, line, and plane; the properties of surfaces; intersections and devel-

opments of surfaces. Text: Miller's *Descriptive Geometry.* Daily, 8-11; 303 Transportation Building; 4 credit-hours. Mr. JORDAN.

(The courses given under Art and Design are of interest to students of Manual Arts).

S 6. PATTERN SHOP.—The care and use of tools; the construction of patterns, core-boxes, and the use of machines such as are found in modern pattern shops Daily, 9, 10, 11; Wood Shop; 3 credit-hours. Mr. GROSS.

S 7. MACHINE-SHOP.—Chipping and filing; elementary work on lathe, drill press, shaper, planer, and grinding machine. Daily, 2, 3, 4; Machine Shop; 2½ credit-hours. Mr. RADEBAUGH.

S 8. ADVANCED MACHINE-SHOP.—The use of milling machine, screw machine, gear cutter, boring mill and turret lathe; erecting and testing of machines and gas engines. Daily, 2, 3, 4; Machine Shop; 2½ credit-hours . Mr. RADEBAUGH.

MATHEMATICS

Dr. LYTLE, Dr. WAHLIN, Dr. KEMPNER, Mr. ROWLAND, Mr. RUTLEDGE.

S 2. COLLEGE ALGEBRA.—(Equivalent to the regular university course). Text: Rietz and Crathorne's *College Algebra* (Henry Holt and Co.) M.T.W.T.F., 10; 419 N.H.; 3 credit-hours. Dr. WAHLIN.

Prerequisite: 2½ units entrance mathematics.

S 4. PLANE TRIGONOMETRY.—(Equivalent to Mathematics 4). Text: Kenyon and Ingold's *Trigonometry,* (The Macmillan Co.) M.T.W.T.F., 11; 434 N.H.; 2 credit-hours. Dr. LYTLE.

Prerequisite: 2½ units entrance mathematics.

S 6. ANALYTICAL GEOMETRY.—(Equivalent to Mathematics 6.) An introductory course in plane and solid analytic geometry. Text: Ziwet and Hopkins' *Analytic Geometry,* (The Macmillan Co.) M.T. W.T.F., 8 and 9; 432 N.H.; 5 credit-hours. Dr. KEMPNER.

Prerequisite: Math. 2 and 4.

S 7. DIFFERENTIAL CALCULUS.—(Equivalent to Mathematics 7.) Course in beginning calculus. Text: Townsend and Goodenough's *Essentials of Calculus,* (Henry Holt and Co.) M.T.W.T.F., 8 and 9; 431 N.H.; 5 credit-hours. Mr. RUTLEDGE.

Prerequisite: Math. 6.

S 9. Integral Calculus.—(Equivalent to Mathematics 9.) Text: Townsend and Goodenough's *Essentials of Calculus,* (Henry Holt and Co.) M.T.W.T.F.S., 9; 425 N.H.; 3 credit-hours.

Mr. Rowland.

Prerequisite: Math. 7.

S 5. Teachers' Course.—(Equivalent to Mathematics 5.) Secondary algebra and geometry; their educational values; position in course; methods of teaching; correlation; comparison of American methods with those of foreign countries; order of topics; most important topics; text-books; literature. Lectures, discussions, reports. M.T.W.T.F., 10; 434 N.H.; 2 credit-hours. Dr. Lytle.

*S 33. Modern Algebra.—Theory of matrices; systems of linear equations; bilinear and quadratic forms; properties of polynominals; algebraic invariants; elementary divisors. Text: Bôcher's *Introduction to Higher Algebra,* (The Macmillan Co.) M.T.W.T.F.S., 9; 419 N.H.; 3 credit-hours. Dr. Wahlin.

Prerequisite: Math. 9, 10.

MECHANICAL ENGINEERING

(See also Manual Training.)

Mr. Gross, Mr. Radebaugh

S 1. Pattern Shop Practice.—The production of useful patterns by modern methods applied to use of hand and machine tools. Daily, 9-12; Pattern Shop; 3 credit-hours. Mr. Gross.

S 3. Machine Shop Practice.—Modern machine shop manufacturing methods, including machine operation, training in shop management, organization, production methods, dispatching work, ordering, storing and routing materials, time studies, shop accounting, inspection and all activities of the machine department of a manufacturing plant. Daily, 2-5; Machine Shop; 3 credit-hours.

Mr. Radebaugh.

MECHANICS, THEORETICAL AND APPLIED

Mr. Seely, Mr. Ensign, Mr. Gonnerman

S 7. Analytical Mechanics.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* Daily, 10; 202 E.H.; 3 credit-hours. Mr. Ensign.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 8. Analytical Mechanics.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics*. Daily, 10; 208 E.H.; 2½ credit-hours. Mr. Seely.

Prerequisite: Mathematics 9 and T. & A. M. 7.

S 9. Resistance of Materials.—Training in the elementary principles of the mechanics of materials, with experiments and investigations in the materials laboratory to verify the experimental laws; problems in ordinary engineering practice to train the student in the use of his knowledge. This course covers the same ground both in text-book, problem work, and in experiments in the materials testing laboratory as T. and A. M. 9. Merriman's *Mechanics of Materials*. Daily, 11; 208 E.H.; M.W., 8, 9; L.A.M.; 3½ credit-hours. Mr. Seely, Mr. Gonnerman.

Prerequisite: T. and A. M. 7 and registration in T. and A. M. 8.

S 10. Hydraulics.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observation and measurement of pressure, velocity, and flow, in power and efficiency, and in the determination of experimental coefficients. Hoskin's *Hydraulics*. M.T.W.T., 2; 202 E.H.; T.T., 8, 9; Hyd. Lab.; 3 credit-hours. Mr. Gonnerman.

Prerequisite: T. and A. M. 8.

Note: With the opening of the hydraulic laboratory for the Summer Session, arrangements may be made to use its facilities for special experimental work.

S 14. Elements of Mechanics.—The principles of kinematics, kinetics, and statics and their application. Moreley's *Mechanics for Engineers*. (For architects and others who have not taken the calculus.) M.W.F.S., 8, and T.T., 8-10; 202 E.H.; 4 credit-hours. Mr. Ensign.

Prerequisite: Mathematics 2, 4.

MUSIC

Assistant Professor Smith, Miss Brainard

METHODS OF TEACHING

S 1. Primary and Intermediate Grades.—This course offers presentations of rote songs and of various important technical problems necessary to successful work in the eight grades; proper care of

children's voices; correct breathing and interpretation. M.T.W.T., 8; 126 U.H.; 1½ credit-hours. Assistant Professor Smith.

S 2. High School Appreciation Course.—Organization of classes and equipment; voice culture as applied to the adolescent voice; fundamental principles of harmony; musical history in connection with the lesson of the day. M.T.W., 9; 126 U.H.; 1½ credit-hours. Assistant Professor Smith.

S 3. General Appreciation Course.—For the non-musician; illustration on the victrola. Th., 9; 126 U.H.; *No university credit.* Assistant Professor Smith.

S 4. Theory and Ear-Training.—This course includes the fundamental principles of music; oral and written; dictation; and vocal harmony. M.W.F., 10; 126 U.H.; *No university credit.* Miss Brainard.

SIGHT-SINGING

S 5. Elementary Course.—Music-notation; syllables; scale structure; ear and eye-training and application of knowledge to music reading. M.W.F., 10; 126 U.H.; *No university credit.* Miss Brainard.

S 6. Advanced Course.—Drill in one, two, three and four-part reading, suitable exercises for breath control, enunciation and phrasing. M.W.F., 11; 126 U.H.; *No university credit.* Miss Brainard.

Campus sings every Wednesday evening at 6:45, Auditorium steps. Assistant Professor Smith.

Note: Miss Florence Kirkup, of the Voice Department, and Mr. L. L. Townsend, A.M., of the Piano Department, will be at the University during the Summer Session. Private lessons in the above subjects may be arranged for by applying to Assistant Professor Smith, or Miss Kirkup and Mr. Townsend.

PHYSICAL TRAINING

Athletic Coaching and Playgrounds

Director Huff, Mr. Gill, Mr. Jones, Mr. Zuppke, and Mr. Casner

S 10. Baseball.—Theory and practice in batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules; physical condition; methods of indoor practice. Lectures and practical work. W.T.F.S., 8-10; 2 credit-hours. Director Huff.

S 11. Track and Field Athletics.—Instruction and practical demonstration in starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; practical talks on methods of preparing contestants for different athletic events; adaptations to individual peculiarities; rules of competition; study of physical condition, including endurance, speed, fatigue, and all means of training for condition; work is assigned for the promotion, management, and officiating of games and meets. Lectures and practical work. T.W.F.S., 10-12; 2 credit-hours.

Mr. Gill.

S 12. Basketball.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. Lectures and practical work. M.T.W.T., 1-3; 2 credit-hours. Mr. Jones.

S 13. Football.

Theoretical:

a. Rules from the standpoint of coach, players, and officials.
b. Several styles of offense and defense with consideration of their special strengths and weaknesses.
c. Generalship and strategy.

Practical:

a. Training, conditioning, and players equipment.
b. Punting, drop kicking, place kicking, kick off, and forward passing.
c. Tackling dummy and charging sled.
d. Special drills for linemen, ends, and backs.
e. Following the ball, interference, and team work.
f. Fundamental plays, freak plays, and signal systems.

Lectures and practical work. M.T.F.S., 3-5; 2 credit-hours.

Mr. Zuppke.

S 14. Play and Play Grounds.—Philosophy of play; consideration of various theories of Schiller, Spencer, and Froebel; educative value of play; history of the playground movement; aims and purposes of the playground; child study; demonstration and instruction in games and other activities of the playground; exercises adapted to the age of child, time of day and season, corrective gymnastics; first aid to the injured, with special attention to playground injuries; construction and equipment of playgrounds;

various types of apparatus; administration and management of the playground; the playground as a social center; personal qualifications of the playground director. Texts: Mero's *American Playground,* Deland's *Playground Technique and Playcraft,* Bancroft's *Games.* Inspection trips. Lectures and practical work. M.T.W.T., 3-5; 2 credit-hours. Mr. CASNER.

PHYSICAL TRAINING FOR WOMEN

Miss VERNA BROOKS

S 1. METHODS OF IMPROVING POSTURE AND HEALTH, THEORY AND PRACTICE.—Corrective work, including Swedish, clubs and other exercises. Hygienic work, including games, dancing, and other exercises. Lectures, practice, and reading. Text: Bancroft's *The Posture of School Children,* (The Macmillan Co., $1.50.) T.W.T.F.,10;

S 2. SWIMMING.—Games, diving, "Stunts", etc. M.T.W.T.F., 11, 2, 3, 4.

PHYSICS

Assistant Professor WATSON, Dr. WILLIAMS, Mr. SMITH, Mr. WARNER, Mr. NATHANSON.

S 2aI. GENERAL PHYSICS Part 1.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. Text: Kimball's *College Physics.* M.W.F., 11; Lecture Room 119, Physics Building. 1½ credit-hours.

Assistant Professor WATSON, Mr. WARNER.

Prerequisites: Plane geometry and high-school algebra; registration in Physics S 2b1. Plane trigonometry desired.

Equivalent: S 2a (I, II, III) together with S 2b (I, II, III) are equivalent to Physics 2a, 2b for the college year.

S 2bI. INTRODUCTORY LABORATORY PHYSICS Part 1.—A laboratory course in physical measurements on mechanics, properties of matter, etc., to accompany S 2aI. Text: Schulz's *Laboratory Manual.* M.W.F., 2-4; 212 Physics Building; 1½ credit-hours.

Mr. WARNER, Mr. NATHANSON.

Prerequisite: Registration in Physics S 2aI.

Equivalent: See S 2aI.

S 2aII. GENERAL PHYSICS Part II.—Experimental lectures with recitations on electricity and magnetism. Text: Kimball's

College Physics. 1½ credit-hours. Given in 1913; not given in 1914; probably will be given in summer of 1915.

Prerequisites: See S 2aI .

Equivalent: See S 2aI.

S 2bII. Introductory Laboratory Physics Part II.—A laboratory course in electricity and magnetism to accompany S 2aII. 1½ credit-hours. Not given in 1914.

Prerequisite: Registration in S 2aII.

S 2aIII. General Physics Part III.—Lectures with experimental demonstrations and recitations. Topics treated will be heat, light and sound. Text: Kimball's *College Physics.* T.T.S., 11; Lecture Room 119, Physics Building. 1½ credit-hours.

Assistant Professor Watson, Mr. Smith.

Prerequisite: Same as S 2aI.

Equivalent: See S 2aI.

S 2bIII. Introductory Laboratory Physics Part III.—A laboratory course in which the fundamental experiments in heat, light and sound are performed. Text: Schulz's *Laboratory Manual.* T.T., 2-4; S 8-10; 212 Physics Building; 1½ credit-hours.

Mr. Smith, Mr. Nathanson.

Prerequisite: Registration in Physics S 2aIII.

Equivalent: See S 2aI.

S 4. Electrical and Magnetic Measurements.—An advanced laboratory course with discussions, recitations and reports. Students in electrical engineering whose work is irregular can do the first semester of electrical measurements in the Summer Session and finish with the class during the second semester. No text required. M.T. T.F., 1-4; 112 Physics Building; 2 credit-hours. Dr. Williams.

Prerequisite: A course in general physics and calculus.

Equivalent: First semester of Physics 4.

S 15. Electricity and Magnetism.—Lectures, recitations and laboratory work. The course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses in general physics. The apparatus and laboratory methods used call for high accuracy. Text: Brooks & Poyser, *Magnetism and Electricity.* M.W., 8; F., 1-4; 108 Physics Building; 1½ credit-hours. Dr. Williams.

Prerequisite: A course in general physics.

Equivalent: Physics 15 in part.

S 16. Heat.—Lectures and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, expansion, vapor pressure, etc. This is an intermediate course recommended to students who have already had a course in general physics and desire a more extended knowledge of heat. Text: Edser's *Heat for Advanced Students.* T.T.,2-4; S., 8-10. 213 Physics Building. 1½ credit-hours. Mr. Warner.

Prerequisite: A course in general physics. See instructor in special cases.

Equivalent: Physics 16 in part.

S 18. Teachers' Course.—This course is in two parts;—Part I, under Dr. Watson consists of discussions of methods of organizing laboratory work, quizzes and class demonstrations, criticisms of high-school text-books, principles of selecting and ordering apparatus, etc. Part II under Mr. Smith consists of practical laboratory manipulation, such as glass blowing, minor repairs of apparatus, processes of preparation of direction sheets, etc. T.T., 8; 208 Physics Building; 1 credit-hour. Assistant Professor Watson, Mr. Smith.

Prerequisite: A course in general physics, or teaching experience in physics.

Equivalent: Physics 18 in part.

S 31. Special Problems in Advanced Physical Measurements.—Special laboratory problems such as the accurate determination of the value of "g" with the pendulum, moments of inertia, calibration of a set of weights, accurate determination of pitch of vibrating bodies, inductance, capacity, resistance, etc. Text: Watson's *Practical Physics.* 1 or 2 credit-hours. Arrange time.

Assistant Professor Watson, Dr. Williams.

Prerequisite: A course in general physics, calculus.

S 131. Investigation of Special Problems.—This course is intended for students who expect to work for advanced degrees. The work done should show originality in method, or should contribute new data in experimental investigation.

Assistant Professor Watson, Dr. Williams.

Prerequisite: Registration in Graduate School. See instructor.

S 133. Seminary and Thesis.—

Assistant Professor Watson, Dr. Williams.

Prerequisite: Registration in Graduate School. See instructor.

PHYSIOGRAPHY

Professor Cushing, Mr. Heitkamp

S 1. The Surface Features of the Earth.—A study of their origin, development and classification; includes a study of the work of such agents as streams, glaciers, winds and waves, and of the characteristic land forms produced by each; brief treatment of life responses to physiographic features. This course is designed primarily to meet the needs of teachers of physiography in high schools. Lecture, M.W.F., 11; 249 N.H.; Laboratory, Tu., 1, 2; Field work, Th., 1-5; S., 9-12; 4 credit-hours.

Professor Cushing, Mr. Heitkamp.

S 2. Regional Geography of the United States.—Study of the physiography, climate, and life responses in selected typical regions of the United States such as New England, Great Lakes, Appalachians, Ozarks, Coastal Plain, Glacial Plains, Lake Region of Minnesota, Gulf States, Blue Grass Region of Kentucky, High Plains, Rocky Mountains, Glacier, Yosemite and Yellowstone Parks, Great Basin, Southern California, and North Pacific seaboard. Open to students who have a general knowledge of elementary physiography. Lectures, maps and readings. Lecture, M.W.F., 10; 249 N.H.; Laboratory, Tu.T., 10, 11; 2½ credit-hours.

Professor Cushing, Mr. Heitkamp.

S 3. Meteorology.—General circulation of the atmosphere; conditions that produce the wind belts; characteristics of each belt as to general direction of winds, amount of rainfall, and peculiar climatic influences with causes in each case. Conditions which produce abnormalities in the general circulation, rainfall or climate, as monsoons; near and distant mountains; size and shape of land masses; shape of coast lines; ocean currents; cyclones and anticyclones. Weather: Making and interpretation of observations; forecasting; causes of normal and abnormal types. Study of specific areas having abnormal climates, such as China, England, Argentina, Alaskan coast, Eastern equatorial Africa, Gulf States of United States, Bengal, Gobi. Lectures and laboratory, M.W.F., 2, 4; 249 N.H.; 1½ credit-hours. Mr. Heitkamp.

S 4. Advanced Physiography.—A course intended for those already familiar with the elementary principles of physiography who

wish to pursue the subject further. An introduction to physiographic literature. Lectures, conferences, and laboratory, field trips. Topics for study may be determined in some measure by vote of the class. M.W.F., 1, 2; 249 N.H.; 1½ credit-hours.

Professor CUSHING.

POLITICAL SCIENCE

Professor MORAN, Mr. STORY

S 1. MUNICIPAL GOVERNMENT.—The growth of cities; municipal organization and functions in the United States; the mayor and the council; commission government; police; light and water supply; city planning; urban transportation; municipal ownership and regulation of public utilities; charities; education. Text: Munro's *The Government of American Cities.* Lectures and assigned reading. Daily, 1; 317 L.H.; 2½ credit-hours. Mr. STORY.

S 2. GOVERNMENT OF ILLINOIS.—Historical and Constitutional development; organization and administration of state and local government; the legislature; the executive; the judiciary; state officers and institutions; county; town and municipal government. Lectures and assigned readings. Daily, 2; 317 L.H.; 2½ credit-hours.

Mr. STORY.

*S 3. THE ENGLISH GOVERNMENT.—A discussion of the theory and practice of the English Government as it now exists; a study of the theoretical and practical prerogatives of the Crown; the origin, composition and fundamental principles of the Cabinet; ministerial responsibility; the origin, composition and functions of the Houses of Parliament; the procedure, sovereignty and privileges of Parliament; and the present trend of British politics; constant comparisons with the government of the United States and, to a less extent, with those of the leading European countries. Some attention will be given to the organization of the British Empire and to the government of the colonies. Daily, 10; 317 L.H.; 2½ credit-hours.

Professor MORAN.

Open to graduates and undergraduates who have had at least one college course in political science or English history.

SOCIOLOGY

Professor WEATHERLY

S 1. PRINCIPLES OF SOCIOLOGY.—Principles which underlie the practical problems of education and progress. Lectures, discussions and assigned reading. T.W.T.F., 11; 306 L.H.; 2 credit-hours.

Professor WEATHERLY.

*S 10. POPULATION.—Theories and policies of population; Malthus' "Principle" and its critics; problems of American population; immigration, race mixture, conditions affecting public health, death-rate, birth-rate, "race-suicide", marriage, divorce, etc.; selective influences at work on the "population type". T.W.T.F., 9; 306 L.H.; 2 credit-hours. Professor WEATHERLY.

*S 3. SOCIAL EVOLUTION.—Comparative study of modes of social activity among people at different stages of progress, savage, barbarous and civilized; family organization, practical arts, economic wants and institutions, origins of government and law, codes of morality, religions; inductions from such facts as to the theory of social evolution and the method of progress. M.W., 10; 306 L.H.; 1 credit-hour. Professor WEATHERLY.

ZOOLOGY

Professor BARKER, University of Nebraska, and Dr. PACKARD, Bradley Polytechnic Institute.

COURSES FOR UNDERGRADUATES

S 1. GENERAL ZOOLOGY.—The nature of living matter, the principles underlying the functional activities of animals, the geographical distribution of animals, the essential features of evolution, and the general principles of heredity.

By field trips and the use of individual aquaria and vivaria, the class will study the more common forms of animal life in their natural surroundings and learn where and how to collect for demonstration and class purposes.

Lectures and quiz, M.T.W.T.F., 9; Laboratory five times a week, 10-12; 312 N.H.; 5 credit-hours. Laboratory fee $2.00.

Professor BARKER and Dr. PACKARD.

No prerequisites.

Equivalent: Zoology I.

S 19. Teachers' Course.—A seminar conducted informally as a round table, designed for present and prospective teachers of zoology, especially in high schools. Concrete problems to be considered: the proper training and preparation of the teachers; the objective of high-school zoology; where the subject should come in the course; a rational and practical course in zoology; a uniform high-school course in zoology; the correlation of class-room and laboratory work; the organization of class and laboratory work; critique of text-books and laboratory manuals; field work in zoology; the making of laboratory apparatus; where and how to collect material for demonstration and laboratory use. T.Th., 8; 229 N.H.; 1 credit-hour. Professor Barker.

Prerequisite: Open to teachers of zoology, to those having had a course in zoology, and to those taking the course in General Zoology.

S 7. Human Biology.—An elementary course on the general structure, functions, and hygiene of the human body adapted to the needs of teachers of high-school biology and physiology. The effects of drugs and narcotics, the development of man, and the principles of heredity and eugenics will be considered.

Practical work in the laboratory will include a study of the structure of the various organs of the body and simple experiments to demonstrate their functions. Instruction in the preparation of material for demonstration will also be given. Lectures, M.W.F., 1; Laboratory work, M.W.F., 2-4; 312 N.H.; 3 credit-hours. Laboratory fee, $2.00. Dr. Packard.

COURSE FOR GRADUATES AND ADVANCED UNDERGRADUATES

*S 21. Introduction to Zoological Research.—Investigation of topics, usually repeating the work of earlier investigators, on the morphology, life history, or reciprocal relations of invertebrate forms. Laboratory; conferences; assigned reading. Laboratory fee, $2.00. Hours to be arranged. Professor Barker.

Prerequisite: One year of college work in Zoology.

University of Illinois Location

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis Railroads. The cities of Urbana and Champaign have together a population of 24,000.

The institution was incorporated February 28, 1867, under the name, the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred thirty-five acres, besides a farm of about eight hundred fifty acres. The buildings at Urbana are forty-five in number, chief of which are the Agricultural Building, the Agronomy Building, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the Library Building, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, the Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop and Foundry. The Commerce Building, the Transportation Building, and a large addition to the Woman's Building have been completed this year. The new Armory, and Stock Judging Pavilion, are almost completed. Work on the School of Education Building is just beginning.

Libraries

The general University library, at Urbana, contains 251,000 volumes. The general reading rooms contain over 10,000 volumes. The University has a subscription list of 1,300 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 8,200 volumes and 22,000 pamphlets.

The library is housed, for the most part, in the Library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

Athletics

Although both the men's and women's gymnasium will be used in some parts of the regular class work in Physical Training, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums are well equipped. Each contains swimming pool, shower, and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts upon the University campus are open to the student body. The general athletic fields will be open to the students. The golf links, which are in the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, base ball clubs, etc.

Playground Work and Coaching

In addition to the regular gymnasium work, special courses in coaching high-school athletics will be offered under the general direction of George A. Huff, Director of Physical Training for Men. This work has been added because of the increasing demand for trained men to direct high-school athletics. A playground specialist has been secured to direct the Summer Session work in this field and to offer instruction to superintendents, principals, and teachers who are interested in this movement. The playground work will be supplemented by courses designed for those who wish instruction in directing playgrounds.

Courses will be offered in baseball coaching (Mr. Huff), football coaching (Mr. Zuppke), basketball coaching (Mr. Jones), and track coaching (Mr. Gill). These courses are particularly adapted to high-school teachers and principals who are engaged for part of their time in coaching athletic teams. The courses will be so ar-

ranged that a student may, if he desires, devote his entire program to this work.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board can be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or

W. C. Bagley, Director
W. S. Miller, Secretary
Room 203, University Hall,
Urbana, Illinois.

The University of Illinois

Summer Session

June 21 to August 13, 1915

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UNIVERSITY OF ILLINOIS

EDMUND JANES JAMES, Ph.D., LL.D., President of the University.

WILLIAM CHANDLER BAGLEY, Ph.D., Director of the School of Education; *Director of the Summer Session.* (Office, Room 203, University Hall.)

GEORGE ENFIELD FRAZER, A.B., LL.B., Comptroller.

CHARLES MAXWELL MCCONN, A.M., Registrar. (Office, 321 Natural History Building.)

CALENDAR

SUMMER SESSION

June 21, 1915, Monday	Registration Day
August 12 and 13, Thursday and Friday	Final Examinations

FIRST SEMESTER

September 13 to 17, Monday to Friday	Entrance Examinations
September 20 and 21, Monday and Tuesday	Registration Days
September 22, Wednesday, 8 a. m.	Instruction Begins

ANNUAL REGISTRATION OF STUDENTS

'94-'95	810
'95-'96	855
'96-'97	1075
'97-'98	1585
'98-'99	1825
'99-'00	2234
'00-'01	2505
'01-'02	2950
'02-'03	3288
'03-'04	3594
'04-'05	3729
'05-'06	4070
'06-'07	4316
'07-'08	4743
'08-'09	4977
'09-'10	5118
'10-'11	5217
'11-'12	5200
'12-'13	5087
'13-'14	5529
'14-'15	6004

STAFF OF INSTRUCTION

SUMMER SESSION, 1915

Bagley, William Chandler, Ph.D., Professor of Education.

Balke, Clarence William, Ph.D., Professor of Inorganic Chemistry.

Barto, Daniel Otis, B.S., Associate in Poultry Husbandry.

Barto, Philip Stephan, A.M., Instructor in German.

Bayley, Paul LeVern, A.M., Assistant in Physics.

Beal, George Denton, Ph.D., Instrctor in Chemistry.

Bogart, Ernest Ludlow, Ph.D., Professor of Economics.

Bole, Simeon James, M.A., Associate in Pomology in College of Agriculture and Station.

Boyer, Clarence Valentine, Ph.D., Associate in English.

Canter, Howard Vernon, Ph.D., Assistant Professor of Classics.

Carnahan, David Hobart, Ph.D., Associate Professor of Romance Languages.

Carry, Charles Seraphin, Assistant in Romance Languages.

Carter, Clarence E., Ph.D., Professor of History, Miami University, Oxford, Ohio.

Coffman, Lotus Delta, Ph.D., Professor of Education.

Crandall, William Truman, M.S., Associate in Milk Production.

Crane, Rufus, A.B., B.S., Instructor, General Engineering Drawing.

Curl, Mervis James, M.A., Instructor in English.

Derick, Clarence George, Ph.D., Assistant Professor of Chemistry.

Dodge, Daniel Kilham, Ph.D., Professor of English Language and Literature.

Duncan, James Merion, Assistant in Pattern Making.

Ekblaw, Karl John Theodore, M.S., Associate in Farm Mechanics.

Ensign, Newton Edward, A.B., B.S., Instructor in Theoretical and Applied Mechanics.

Folsom, Justus Watson, D.Sc., Assistant Professor of Entomology.

Galloway, Thomas Walton, Ph.D., Professor of Zoology, James Millikin University, Decatur, Illinois.

GILL, HARRY LOVERING, Instructor in Track Athletics.

GLIMSTED, OLAF HAROLD, Physical Training for Men.

HAAS, LEWIS J., Art Metal.

HAYES, EDWARD CAREY, Ph.D., Professor of Sociology.

HELD, FELIX E., A.M., Associate Professor of German, Miami University, Oxford, Ohio.

HENDERSON, WILLIAM F., A.B., James Millikin University, Zoology.

HILL, MARY, Assistant in Art and Design.

HOLLIS, DAVID PRESTON, Assistant in Chemistry.

HOLLISTER, HORACE ADELBERT, M.A., Professor of Education and High School Visitor.

HOPE, LEONA (Boston), Household Science.

HOPKINS, B. SMITH, Ph.D., Associate in Chemistry.

HORMELL, O. C., A.M., Professor of History at Bowdoin College.

HOTTES, CHARLES FREDERICK, Ph.D., Professor of Botany.

HUFF, GEORGE A., Director of Physical Training for Men.

JAMISON, ALBERT WOODWARD, M.S., Associate in Agricultural Extension.

JOHNSTON, CHARLES HUGHES, Ph.D., Professor of Education.

JONES, HARRY STUART VEDDER, Ph.D., Assistant Professor of English.

JONES, LLOYD THEODORE, M.S., Instructor in Physics.

JONES, RALPH R., Basket Ball Coach.

KAMM, OLIVER, M.S., Assistant in Chemistry.

KEMPNER, AUBREY J., Ph.D., Instructor in Mathematics.

KNIPP, CHARLES TOBIAS, Ph.D., Assistant Professor of Physics.

KOLLER, ARMAN HAJMAN, Ph.D., Instructor in German.

KUNZ, JACOB, Ph.D., Assistant Professor of Physics.

LAMKEY, ERNEST MICHAEL, M.A., Assistant in Botany.

LINDER, GRACE, Assistant in Household Science.

LYBYER, ALBERT HOWE, Ph.D., Associate Professor of History.

MACARTHUR, CHARLES G., Instructor in Chemistry.

MCJOHNSTON, HARRISON, M.A., Instructor in Business English and Salesmanship.

MILLER, WILFORD STANTON, M.A., Assistant and Secretary in Education.

MOULTON, GERTRUDE E., A.B., Director of Physical Training for Women.

NATHANSON, JONAS BERNARD, M.A., Assistant in Physics.

OLDFATHER, WILLIAM A., Ph.D., Associate Professor of Classics.

PARK, JOSEPH C., Director of Industrial Education, Oswego, New York, State Normal School.

PETERSON, WILLIAM ALVAH, B.S., M.A., Assistant in Entomology.

POOR, CHARLES MARSHALL, Ph.D., Instructor in German.

RANDOLPH, OSCAR ALAN, M.S., Assistant in Physics.

RUGG, HAROLD ORDWAY, B.S., C.E., Education.

SCOVILL, HIRAM THOMPSON, A.B., Instructor in Accountancy.

SEARS, GEORGE WALLACE, Ph.D., Instructor in Chemistry.

SEELY, FRED B., B.S., Instructor in Theoretical and Applied Mechanics.

SHAW, JAMES BURNIE, D.Sc., Assistant Professor of Mathematics.

SHERMAN, STUART PRATT, Ph.D., Professor of English and Chairman of the Department.

SMITH, CONSTANCE BARLOW, Assistant Professor of Sight Singing, Ear Training and Public School Music.

SMITH, LOUIE HENRI, Ph.D., Professor of Plant Breeding, College of Agriculture and Chief in Plant Breeding in Agricultural Experiment Station.

SMITH, WILLIAM HERSCHEL, M.S., Instructor in Animal Husbandry.

SOTO, RAFAEL ARCANGEL, B.S., Assistant in Romance Languages.

STANTON, MARGARET BEAUMONT, B.S., M.A., Instructor in Household Science.

STORY, RUSSELL MCCULLOCH, M.A., Instructor in Political Science.

SWAN, GRACE, Assistant in Music.

THOMPSON, CHARLES MANFRED, Ph.D., Associate in Economics.

VALLANCE, ALEX, M.E., Instructor in Theoretical and Applied Mechanics.

WAHLIN, GUSTAF ERIC, Ph.D., Associate in Mathematics.

WEBER, HENRY CHARLES PAUL, Ph.D., Assistant Professor of Chemistry.

WHIPPLE, GUY MONTROSE, Ph.D., Associate Professor of Education.

WILSON, WILLIAM HAROLD, M.A., Assistant in Mathematics.

WOOLBERT, CHARLES HENRY, M.A., Associate in English.

ZEIS, HENRY CHARLES, A.B., Assistant in Mathematics.

ZUCKER, ADOLPH EDWARD, M.A., Assistant in German.

ZUPPKE, ROBERT CARL, Ph.B., Instructor in Physical Training.

GENERAL STATEMENT

The Summer Session of the University of Illinois for 1915 will open on June 21 and close on August 13, making a term of *eight weeks*. The opening day will be devoted to registration. The final examinations will be held on Thursday and Friday of the last week.

All of the courses, except those in physical training for men, will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Session a certificate for such attendance, but university credit will not be given for six weeks courses, except for those in physical training for men and in athletic coaching which will extend through only the first six weeks of the session.

The number of credit-hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight credit-hours or less.

Purpose

The primary purpose of the Summer Session is to meet the needs of teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. The greater number of courses offered are designed particularly for high-school teachers, supervising officers, and teachers of special subjects (art, music, manual training, domestic science, agriculture, etc.) and for college instructors, school supervisors, and principals who are working for advanced degrees. At the same time, students who may not fall within these groups are welcomed at the Session, and several courses of a more general nature are provided to meet their needs.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the college of the University (Liberal Arts and Sciences, or Engineering, or Agriculture) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must obtain credit, either by passing entrance examinations, or by presenting certificates of work

completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

The subjects prescribed for admission to the course in liberal arts are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; foreign language, 3 units (2 units must be in the same language); history, 1 unit. Five and one half elective units are required to make up the total of 15 units.

For the course in science in the College of Liberal Arts and Sciences, and for the College of Agriculture, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; science, 2 units. Seven and one half elective units are required to make up the total of 15 units.

For the College of Engineering, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit; physics, 1 unit. Eight elective units are required to make up the total of 15 units.

Persons who lack not more than two units of the requirements for any one of the colleges as stated above, may be admitted as *conditioned students.* Conditions must in every case be removed within the first year of residence.

Admission to courses which give university credit, *as special students, not candidates for a degree,* may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

Registration

Students will present themselves for registration on Monday, June 21. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first consult with Dean David Kinley of the Graduate School. (Dean Kinley's office is Room 109, Commerce Building.)

All fees are due upon registration, and should be paid at the Business office, Room 323, Natural History Building.

Fees

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee is charged in some courses for materials used. Any single course may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken. A single course is understood to mean not more than two and one-half credit-hours.

Scholarships

By ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must either pass the entrance examinations, or present a certificate from an accredited high school or other evidence of having completed the requisite amount of preparatory work. (See pages 8 and 9.)

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class 1915, and to persons (otherwise qualified) who have not been teachers during the past year, but who are under contract to teach in the State during the coming year.

A person who wishes to take advantage of the scholarship privileges should present to the Director of the Session prior to June 1, 1915, a statement from the board of education employing him to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal-school graduate (Class 1915) may present either his diploma or a written statement from the President of the normal school certifying that the course has been completed.

Application-blanks for scholarships may be obtained by addressing the Director.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted towards the

degrees of Bachelor of Arts and Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part or even in full by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should see the general University catalog (the "Annual Register") under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the Assistant Dean of the college of his choice—

For the College of Liberal Arts and Sciences—Assistant Dean Meyer, Room 304, University Hall.

For the College of Engineering—Assistant Dean Miller, Room 300, Engineering Building.

For the College of Agriculture—Assistant Professor Rankin, Room 100, Agricultural Building.

General Assembly

On the first Thursday of the Session, at 4 p. m., an Assembly will be held in the Chapel of University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc., and the opportunities and advantages of summer work at the University will be explained.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which are in themselves of no little value, and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

The song services, under the direction of Assistant Professor Constance B. Smith, that proved so successful during the last

Session, will be continued. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps each Wednesday evening, 6:45 (except first and last week).

Arrangements have been made with the Ben Greet Players for a series of open-air performances.

Second Annual Conference on Teachers' Institutes

Plans are being made to make the Champaign-Piatt Teachers' Institute, which will be held at the University during the first week in August, a demonstration institute. The Second Annual Conference on Teachers' Institutes will be held at this time.

Courses in Public School Music

An important feature of this year's Session will be the courses in public-school music. These courses will be given by Assistant Professor Constance Barlow-Smith, head of the Department of Public School Music in the University School of Music.

The technical preparation of supervisors of music will receive important emphasis, but certain features of the work will also aim to meet the needs of superintendents and principals who may wish to gain an acquaintance with musical theory and method of teaching.

Finally, the side of appreciation will not be neglected. Arrangements will be made to demonstrate the various methods of bringing the best music into the public schools through the medium of the Victor-Victrola.

For those who wish private instruction in voice, organ, piano, violin, band instruments, or harmony, excellent opportunities will be provided. For further information address either Director J. L. Erb, or Mrs. Constance Barlow-Smith, of the School of Music.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the new certificating law enacted by the General Assembly, in 1913, appear the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate.
   Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate.
   Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate.
   Requirements same as for elementary school certificate except that the examination includes, in addition, sociology, history of education, school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate.
   Examination in common branches.
2. Second-grade elementary-school certificate.
   Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate.
   Examination in the common branches, three of the natural sciences, English, algebra, general history, and pedagogy.
4. High-school certificate.
   Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate.
   Examination in English, educational psychology, history of education, and administration.
6. Kindergarten-Primary certificate.
7. Special certificate.
   Examination in English and principles and methods of teaching.
8. Provisional certificate.
9. Emergency certificate.

Examinations for the *State Elementary School Certficate,* the *State Supervisory Certificate* and the *State High School Certificate* will be held at the University in July; *provided that at least fifteen applicants notify the State Superintendent prior to June 10, 1915, of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction indicates the new method of preparing theses:

"A thesis prepared under the direction of a teacher in normal school, college or university, either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected.

"The thesis must be filed with the Superintendent of Public Instruction before July 15, 1915."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session Courses are especially adapted to prepare for the professional examinations:

Education S-1a, S-1b, S-10a and S-10b, Principles and Methods of Teaching.

Education S-15, School Hygiene.

Education S-4, S-20 and S-21 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S-2; History of Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-1 should prepare for the examination in educational psychology.)

Education S-6; The Principles of High School Education.

Education S-104; Seminary in Educational Administration.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Manual Training

The work in manual training will be under the direction of Director Joseph C. Park, of the Department of Industrial Education, State Normal School, Oswego, New York. The work will include courses in wood-working and art metal work.

The demand for well-qualified teachers of manual training is becoming more and more insistent each year, and the University is not now able to supply even a small fraction of the teachers of manual training that are called for by the schools of the State. The Summer work is particularly important since it is planned especially to meet the needs of teachers of manual training in the elementary and high schools.

Agriculture

The demand for teachers of agriculture in the high schools has led to an extension of the summer offerings in this subject. The courses in secondary-school agriculture are planned primarily to meet the needs of teachers of agriculture in the high schools. The courses will include a study of general agriculture adapted to secondary schools, with emphasis placed on the subject-matter of agriculture, and such reference to the methods of presentation as the needs of the class demand.

Household Science

The Household Science Department calls attention to the fact that it has made special provision for work in Applied Art in the Summer Session. Miss Leona Hope, formerly of the University of Wisconsin, has charge of the work in Costume Design, Home Decoration and Weaving. Miss Hope has had excellent training in both pure and applied art and a wide experience in teaching them.

Graduate Work in the Summer Session

During the past two years the Summer Session has placed increasing emphasis upon graduate courses leading to the Master's degree. The various departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid upon graduate courses in English, chemistry, economics, and education.

The normal requirement for the Master's degree is satisfactory work continued during one year of residence. This means a residence of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student, by working at the University for one week after each Session under the direction of the professor in charge of his major subject, may earn the Master's degree in four summers.

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigations in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory". Where the investigation of such problems is prosecuted with the coöperation of a university department, it may be possible to count the work toward the Master's degree.

Summer Courses in Library Training

Beginning Monday, June 21, 1915, and continuing for six weeks, the Library School will conduct a Summer Session *to which will be admitted only those actually employed as librarians, or library assistants, or teacher-librarians, or under definite appointment to serve in such positions.* The curriculum will be planned to meet especially the needs of workers in public libraries and in high-school libraries of Illinois and no tuition fee will be charged students entering from this State; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No university credit is given for the work.

The work will occupy the whole time of the student. The number of lectures in each subject will be approximately as follows: Cataloging, 20; classification and book numbers, 13; book selection, 14; administration of small libraries, 10; reference work, 10; work with children, 10; loan systems, order, accession and shelf work, binding and repair, 13.

For further information address the Director of the University of Illinois Library School, Urbana, Illinois.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Training for men. These

courses were offered to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. It was designed to assist both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation.

The courses immediately became popular and there was a large registration. Certificates were issued to students who satisfied the instructors that they had acquired sufficient groundwork to be able to go out and take charge of coaching work. The athletic plant of the University was turned into a laboratory and the larger part of the instruction was given on Illinois field. The Department of Physical Training was able to recommend every man it considered qualified for a position and even then was unable to comply with all requests for competent directors or coaches.

Accordingly the courses will again be a feature of the Summer Session, occupying the first six weeks. It will be eminently practical, all the courses being taught by the men who are successfully coaching the athletic teams of the University of Illinois today. Courses will be offered in baseball (Director Huff), track athletics (Mr. Harry Gill), basketball (Mr. Ralph Jones), and football (Mr. Robert Zuppke).

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Ill.

Explanations of Abbreviations, Etc.

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular university year. Summer courses do not always cover the same ground as those similarly numbered in the regular session. Students wishing to know in what respect such courses are similar will be gladly furnished with the desired information upon application to the Director.

The number of credit-hours that may be earned by any course is clearly indicated in every case.

The word "daily" in the announcement of courses indicates that the class meets five times each week (M.T.W.T.F.). Certain classes meet six times a week, and a few meet twice each day for five or six days.

All courses that are granted graduate credit are marked with an asterisk (*). *Courses numbered 100 and above carry graduate credit and are open only to graduate students.*

The following abbreviations are used to designate the different buildings in which classes are held:

Ag	College of Agriculture
C	Chemical Laboratory
Com.B	Commerce Building
E.H	Engineering Hall
F.M	Farm Mechanics Building
L.A.M	Laboratory of Applied Mechanics
L.B	Law Building
L.H	Lincoln Hall
P.L	Physics Laboratory
N.H	Natural History Building
Stk.Pavil	Stock Judging Pavilion
T.B	Transportation Building
U.H	University Hall
W.H	Woman's Building

OUTLINE OF COURSES

ACCOUNTANCY

S 15. This course is not accepted in partial fulfillment of the requirement of Accountancy 1 in any University course. It is intended for those who wish to study the subject with a view to practice or high-school teaching. M.T.W.T.F. 11; 204 Com.B.; 2 credit-hours. Mr. Scovill.

Prerequisite: Elementary bookkeeping.

AGRICULTURE

Professors Smith, Messrs. Jamison, Barto, Ekblaw, Bole, Crandall, and Smith. Mr. Jamison in charge.

The work in the Summer Session is planned to meet the needs of teachers of Agriculture in elementary and high schools, and also to enable those seeking degrees in Agriculture to cover a large portion of the required freshman subjects. The courses will be accepted as freshman prerequisites for advanced work as far as they go. The numbers used indicate the Winter courses most nearly corresponding. Agricultural courses of the same number cannot be taken for credit in both regular and summer sessions.

The following arrangement is in order of hours of the day, and subjects given at the same hour are listed successively. In no case are more than two subjects mutually exclusive.

Note: Credits in agriculture may be counted for graduation in the College of Agriculture and in certain cases in the College of Liberal Arts and Sciences; students who wish to offer work in this subject for graduation in the latter College should consult the Assistant Dean of that College.

S 1a. (Agr'l Ext'n.) General Agriculture.—Features of agricultural science and practise best adapted to high-school conditions; the best order and methods for their presentation; suiting course and instruction to the needs of the school community; what

laboratory work shall be given; what apparatus may be used; what field work is practical. Lectures, discussions. M.T.W.T.F., 8; 128 Ag.; 2½ credit-hours, not accepted as technical agriculture.

Mr. Barto.

S 5. (An. Hus.) Fundamentals of Live Stock Judging.—The names and location of external parts of the various kinds of live stock; the use of the score card; comparative judging as a method; breed identification, and types of farm animals. Consideration of the materials available for teaching live stock judging in secondary schools. Lectures and practical work. M.T.W.T.F., 8; Stk. Pavil.; 2½ credit-hours. Mr. Smith.

S 6a. (An. Hus.) Principles of Feeding.—Classification, digestibility, and functions of feed nutrients; classification and feeding values of feed stuffs; feed requirements and calculation of balanced rations for farm animals. M.T.W.T., 9; 702 Ag.; 2 credit-hours. Mr. Smith.

S 23. (An. Hus.) Poultry: Types, Breeds, and Varieties.—Exhibiting and judging; principles of breeding; poultry houses and equipment; feeding, hatching, and brooding; market eggs and poultry; crate-fattening and dressing; diseases and their treatment. M.T.W.T.F., 9; 128 Ag.; 2½ credit-hours. Mr. Barto.

S 1b. (Hort.) Orchard and Garden.—Principles of orcharding; the home orchard from planting to bearing; caring for fruit trees; the home vegetable garden. Lectures, recitations, field work. M.T.W.T., 10, 11; 302 Ag.; 2 credit-hours. Mr. Bole.

S 25. (Agron.) Farm Crops.—Plant growth; structure; habits and requirements; preparation of the seed bed; seed selection for productiveness; storing; care of stored grain to prevent deterioration in vitality, or loss in market requirements; grading and fanning of grain as a means of improvement; market grades of grain and grain judging; examination of grains for purity; testing for vitality; weeds: identification, methods of distribution, eradication, control; diseases of farm crops and methods of prevention. M.T.W.T.F., 10, 11; 2½ credit-hours. Professor Smith.

S 3. (Da. Hus.) Elements of Dairy Husbandry.—The dairy herd; dairy sanitation; milk testing; milk products Lectures, demonstrations. T.T., 1, 2; 128 Ag. Bldg.; 1 credit-hour. (Some optional work in milk testing will be offered if desired, but credit will not be given for it.) Mr. Crandall.

S 26. (Agron.) Farm Mechanics and Equipment.—Elements of useful farm practise, agricultural mechanics, and farm equipment; rope-tying and splicing, soldering, babbitting, pipe-cutting and fitting; principles of draft in farm mechanics; efficiency of machines; methods of power transmission; installation and operation of systems of water supply; plumbing, sewage disposal, heating, lighting, ventilating; power plants for the farm and for the house. M.T.W.T.F.,1, 2; F.M.; 2½ credit-hours. Mr. Ekblaw.

S 4. (Agr'l Ext'n). Country Life Problems.—Problems of the farm; duties of citizenship; social, economic, and educational work in rural communities. Lectures and discussions. W., 3; 702 Ag.; ½ credit-hour. Mr. Jamison.

ART AND DESIGN

Miss Hill

S 1. Elementary.—Form drawing from still-life, cast, and nature; principles of outline and shading in pencil, charcoal, and crayon; lectures on the principles of perspective. M.T.W.T.F., 1, 2; 405 U.H.; 2 credit-hours. Miss Hill.

S 20. Art for the Common Schools.—The planning and execution of work in the several divisions of common-school art study; design; black-board drawing. Lectures upon organization, equipment, and the administrative side of the supervisor's work. For supervisors of drawing, and public-school teachers. M.T.W.T.F., 3, 4; 405 U.H.; 2 credit-hours. Miss Hill.

BOTANY

Professor Hottes, Mr. Lamkey

S 3b. Plant Physiology.—A study of the more important physiological processes of plants, with special reference to those concerned in the production of organic matter. By field trips the adaptation in structure and function of our wild and cultivated plants is correlated with the laboratory studies. Opportunity is given for becoming acquainted with the higher and lower plants of the local flora. Text: Duggar's *Plant Physiology* (Macmillan

Co.). Lecture-Quiz, T.T., 3; 229 N.H.; Laboratory, M.W.F., 1-4; 5 credit-hours. Professor Hottes, Mr. Lamkey.

Prerequisite: Entrance credit in Botany or Botany 1.

*S 9a-9b. Plant Anatomy or Physiology.—Problems varied to meet the needs of persons intending to specialize either in anatomy with technique, or physiology, or in the application of these to medicine, plant breeding, crop production, forestry, etc. Arrange time; 105 Botany annex; 3 or 5 credit-hours. Professor Hottes.

Prerequisite: 10 hours of botany, including course 3a or 3b, and junior standing.

Equivalent: Botany 9a or 9b.

*S 102. Physiology.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned upon consultation. Reports and discussions of current literature and research results. Arrange time; 105 Botany Annex; ½ or 1 unit. Professor Hottes.

Equivalent: Botany 102.

CHEMISTRY

Professor Balke, Assistant Prfessors Derick and Weber, Dr. Beal, Dr. Hopkins, Mr. MacArthur, Dr. Sears, Mr. Kamm, Mr. Hollis.

Note: All of the courses in chemistry offered in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

Graduate Work.—The courses which are starred (*) below are accepted for graduate credit in accordance with the introductory paragraphs of the Graduate School Circular under the head of Chemistry.

S 1. Elementary Chemistry.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements; the course consists of illustrated lectures, recitations, and laboratory work. Text: Noyes' *Text Book of Chemistry*, (Henry Holt and Company). Lecture—Quiz, M.T.W.T.F.S., 11; Laboratory, M.T.W.T.F.S., 8, 9, or 9, 10; 321 Chemistry Building; 5 credit-hours. Professor Balke, Dr. Hopkins.

S 1a and S 1b. Inorganic Chemistry.—For students who have had one year of high-school chemistry, or inorganic chemistry for engineering students. These courses may be taken at the same hours

as Chemistry S 1, but only half the laboratory time indicated for S 1 is required. 321 Chemistry Building; 4 credit-hours.

Professor BALKE, Dr. HOPKINS.

S 2. DESCRIPTIVE INORGANIC CHEMISTRY.—A continuation of S 1 and is devoted mainly to the study of the metallic elements, their compounds, and properties; the course consists of illustrated lectures and recitations, but does not include laboratory work. Text: Noyes' *Text Book of Chemistry,* (Henry Holt and Company). M.T.W.T.F., 8; 321 Chemistry Building; 2 credit-hours.

Professor BALKE.

Prerequisite: Chemistry 1.

S 3. QUALITATIVE ANALYSIS.—Lectures, recitations, and laboratory practice in the ordinary processes of qualitative analysis, Noyes and Smith's *Qualitative Analysis,* (Henry Holt and Company). Lecture, T.T.S., 9; Laboratory, M.T.W.T.F.S., 10, 11; 319 Chemistry Building; 3 credit-hours. Assistant Professor WEBER.

Prerequisite: Chemistry 1.

*S 5a. ELEMENTARY QUANTITATIVE ANALYSIS.—The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods; the lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis,* (The Macmillan Company). M.T.W.T.F., 8-12; 208 Chemistry Building; 5 credit-hours. Dr. BEAL, Dr. SEARS.

Prerequisite: Chemistry 1 and 3.

*S 5c. FOOD ANALYSIS.—Quantitative organic analysis, with special refernce to the examination of food and drug products: alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis* and Sherman's *Food Products,* (The Macmillan Company). *"Bulletin 107, rev., U. S. Bureau of Chemistry."* M.T.W.T.F., 8-12; 208 Chemistry Building; 5 credit-hours. Dr. BEAL, Dr. SEARS.

*S 9a. ORGANIC SYNTHESIS.—This course consists of the preparation of the typical compounds discussed in S 14. Text: Noyes' *Organic Chemistry for the Laboratory,* (Chemical Publishing Company). M.T.W.T.F., 9-12; 213 Chemistry Building; 2 credit-hours.

Assistant Professor DERICK, Mr. KAMM.

Prerequisite: Registration in S 14 (First Semester).

*S 9b. Organic Synthesis.—Continuation of S 9a. Text: Noyes' *Organic Chemistry for the Laboratory.* M.T.W.T.F., 9, 10, 11; 213 Chemistry Building; 2 credit-hours.

Assistant Professor Derick, Mr. Kamm.

Prerequisite: S 9a and registration in S 14 (Second Semester).

*S 14. Organic Chemistry (First Semester).—A discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideration of most of the important classes of derivatives of carbon. This course may be substituted for Chemistry 9 of the academic year. M.T.W.T.F.S., 8; 213 Chemistry Building; 3 credit-hours. Assistant Professor Derick, Mr. Kamm.

Prerequisite: Chemistry 2 and 3.

*S 14. Organic Chemistry (Second Semester).—Lectures and recitations. Noyes' *Organic Chemistry,* (Henry Holt and Company). Daily, arrange; 213 Chemistry Building; 3 credit-hours.

Assistant Professor Derick.

Prerequisite: Chemistry S-14 (First Semester) or equivalent.

*S 11 and *S 111.—Research.—Opportunity will be given for advanced work and research in inorganic, organic, analytical, or physiological chemistry. Arrange.

Professor Balke, Assistant Professors Derick and Weber, Dr. Beal, Mr. MacArthur.

(Subject to approval of Graduate School Faculty.)

*S 13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Talbot's *Quantitative Chemical Analysis,* (The Macmillan Company). (For students in Agriculture.) M.T.W.T.F., 8-12; 208 Chemistry Building; 5 credit-hours. Dr. Beal, Dr. Sears.

*S 15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion; bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroughly for the prospective student of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Hammarsten's *Text Book of Physiological Chemistry;* Hawk's *Practical Physiological Chemistry.* Arrange; 217 Chemistry Building; 5 or 7 credit-hours. Mr. MacArthur.

S 17. TEACHERS' COURSE.—A study of the methods which may be followed in teaching *elementary chemistry,* and a review of the fundamental principles of the science. Arrange; 321 Chemistry Building; 1 credit-hour. Professor BALKE.

Prerequisite: One year's work in chemistry.

CLASSICAL DEPARTMENT

LATIN and GREEK

Associate Professor OLDFATHER and Assistant Professor CANTER.

S 1. TERENCE.—Three plays will be read with brief discussions of the language and verse of comedy. For those who have had three or four years of high-school Latin. M.T.W.T.F., 3; 120 L.H.; 2½ credit-hours. Assistant Professor CANTER.

S 2. THE PRIVATE LIFE OF THE ROMANS.—The house, marriage, dress, education, and amusements of the Romans will be considered. Lectures and assigned readings. The lantern will be used to illustrate the subjects discussed. T.T., 2; 120 L.H.; 1 credit-hour. Assistant Professor CANTER.

S 3. TEACHERS' COURSE.—Special attention to the problems and methods of instruction in Latin in the secondary schools: the essentials of Latin study in the first, second and third years; books and equipment. The slides and photographs of the classical department and classical museum will be at the disposal of the class. M.W.F., 2; 120 L.H.; 1½ credit-hours. Assistant Professor CANTER.

S 4. GREEK HISTORY AND PRIVATE LIFE.—Lectures and assigned readings. The lantern will be used to illustrate the subjects discussed in private life. T.W.T.F., 1; 120 L.H.; 2 credit-hours. Associate Professor OLDFATHER.

FOR GRADUATES AND ADVANCED UNDERGRADUATES

*S 16. SUETONIUS.—The biographies of Julius Caesar and Nero. Lectures and assigned readings. For those who have had three years of college Latin or the equivalent. M.W.F., 2; (Fourth hour to be arranged); 114 L.H.; 2 credit-hours. Associate Professor OLDFATHER.

*S 114. CAESAR.—A study of the historical works, especially the Bellum Gallicum, in their literary and historical setting. ½ unit; 2 hours; arrange; 114 L.H. Associate Professor OLDFATHER.

GENERAL ENGINEERING DRAWING

Mr. Crane

S 1. Elements of Drafting.—Required of all engineering students; consists of freehand and mechanical lettering; practise in the use of instruments on standard set of working drawing plates; tracing, machine sketching, isometric and oblique projection, and perspective. Text: Miller's *Mechanical Drafting.* M.T.W.T.F., 8-11; 303 Transportation Building; 4 credit-hours. Mr. Crane.

S 2. Descriptive Geometry.—Problems relating to the point, line, and plane; the properties of surfaces; intersections and developments of surfaces. Text: Miller's *Descriptive Geometry.* M.T.W.T.F., 8-11; 303 Transportation Building; 4 credit-hours.

Mr. Crane.

ECONOMICS AND COMMERCE

Professor Bogart, Dr. C. M. Thompson, Mr. Scovill, Mr. McJohnston

S 2. Principles of Economics.—M.T.W.T.F.; Section A at 10, Section B at 11; 101 Com.B.; 2 credit-hours.

Dr. C. M. Thompson.

*S 5. Public Finance.—M.W., 9; 101 Com.B.; 1 credit-hour; ¼ graduate unit. Professor Bogart.

Prerequisite: At least 8 hours of economics, (including the principles) or 5 of economics and 6 of history and political science. Teachers of experience may be admitted at the discretion of the instructor.

S 26. Economic Resources of the United States.—M.T.W.T.F., 10; 206 Com.B.; 2 credit-hours. Mr. Scovill.

S 37. Salesmanship and Advertising.—M.T.W.T.F., 9; 312 Com.B.; 2 credit-hours. Mr. McJohnston.

Prerequisite: Economics 1 and 6, or the equivalent. Teachers of experience may be admitted at the discretion of the instructor.

*S 122. Economic History of the United States.—M.W.F., 8; 101 Com.B.; ½ graduate unit. Professor Bogart.

BUSINESS ENGLISH

S 10. Business Letter Writing, including Sales Letters.—M.T.W.T.F., 8; 312 Com.B.; 2 credit-hours. Mr. McJohnston.

Prerequisite: Six hours of Freshman rhetoric

EDUCATION AND PSYCHOLOGY

Professors Bagley, Coffman, Johnston, and Hollister; Associate Professor Whipple; Messrs. Miller and Rugg

Note: The prerequisites as stated in connection with the following courses may, in the discretion of the instructor in charge of each course, be modified in their application to teachers who may desire to enroll in the courses in question.

COURSES FOR UNDERGRADUATES

S 1a. Principles of Education.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; the problem of educational values. M.T.W.T.F.S., 8; 206 U.H.; 3 credit-hours. Mr. Miller.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet this requirement).

Equivalent: With Education S 1b, this course is equivalent to Education 1 as offered during the university year.

S 1b. The Educational System.—A brief survey of the school system of the United States, its present organization, its origin, its distinctive characteristics as compared with other systems, and the more important of its present problems. Lectures and readings. M.T., 2; 206 U.H.; 1 credit-hour. Professor Bagley.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet the requirement).

Equivalent: With Education S 1a, this course is equivalent to Education 1.

S 2. History of Education.—The development of educational theory and practice in their relation to the history of civilization. Text: Monroe's *History of Education:* Brief Course. M.T.W.T.F.; 1; 113 L.H.; 2½ credit-hours. Mr. Rugg.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet the requirement).

Equivalent: Education 2 (in part).

S 10a. The Technique of Teaching.—Types of classroom exercises with practical work in the preparation of plans for teaching the various secondary-school subjects. (Education S 10a and S 10b are equivalent to Education 10, which is one of the courses required by Senate ruling for the official recommendation of the

Appointments Committee). T.W.T.F., 2; 202 L.H.; 2 credit-hours. Professor HOLLISTER.

Prerequisite: Education 1, or its equivalent.

S 10b. CLASS MANAGEMENT.—The technique of class management including a discussion of classroom routine, the sources of waste in poor management, and the problem of school discipline. The course concludes with a discussion of professional ethics in education. (Education S 10a and S 10b are equivalent to Education 10 which is one of the courses required by Senate ruling for the official recommendation of the Appointments Committee.) M.T., 3; 206 U.H.; 1 credit-hour. Professor BAGLEY.

Prerequisite: Education 1, or its equivalent.

S 25. EDUCATIONAL PSYCHOLOGY.—A systematic study of mental activity with special reference to educational problems. The course deals with mental heredity, instinct, habit and learning, attention and interest, association, the training of observation, memory, reasoning, and the like. Texts: Whipple's *Questions in Psychology,* and Colvin and Bagley's *Human Behavior.* T.W.T.F., 9; 417 U.H.; 2 credit-hours. Professor WHIPPLE.

Prerequisite: Junior standing (but, in the discretion of the instructor, open to teachers who cannot meet this requirement).

Equivalent: Education 25 (in part).

COURSES FOR GRADUATES AND UNDERGRADUATES

*S 4. SCHOOL ORGANIZATION AND ADMINISTRATION. — The establishment of schools and provisions for their administration; units of control; maintenance; training and selection of teachers. T.W.T.F., 3; 202 L.H.; 2 credit-hours. Professor HOLLISTER.

Prerequisite: Education 1 or equivalent (but, in the discretion of the instructor, open to teachers who cannot meet this requirement).

*S 6. THE PRINCIPLES OF HIGH-SCHOOL EDUCATION.—A study of the evolution of high schools and of the fundamental conceptions of secondary education; the relationships of the high school to the state system; its legal status; its articulation with the elementary school, with the college, with the technical schools, with the community and with the home. Typical problems to be considered are the teaching staff, reorganization of curriculums, "controls" of construction, direction of student activities and the administration of vocational and moral guidance, school journalism,

debating activities, athletics, high-school hygiene, etc. M.T.W.T., 10; 202 L.H.; 2 credit-hours. Professor JOHNSTON.

Prerequisite: Education 1, or equivalent. (High-school teachers and principals may in the discretion of the instructor be admitted to the course without reference to this prerequisite.)

Equivalent: Education 6 (in part).

*S 18. METHOD IN EDUCATIONAL RESEARCH.—A study of statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees). M.T.W., 2; 113 L.H.; 1½ credit-hours. Mr. RUGG.

Prerequisite: Education 1.

*S 20. SUPERVISION.—A course for principals, superintendents, supervisors. The limitations, types, functions, standards and devices of supervisors; the subject limits and time limits of the course of study; the adaptation of the materials of the course of study to the various types of mind represented in the student population; the rating of teachers; improvement of teachers in service; the technique of criticism. Lectures, readings and investigations of special problems. M.T.W.T., 8; 207 U.H.; 2 credit-hours.

Professor COFFMAN.

Prerequisite: Education 1 or equivalent. (Superintendents, principals, and supervisors may in the discretion of the instructor be admitted into the course without the prerequisite.)

Equivalent: Education 20 (in part).

*S 21. UNITS, SCALES, AND STANDARDS.—A course for school superintendents. An intensive study of units, scales, and standards for measuring educational achievement or determining progress in arithmetic, spelling, handwriting, reading, composition, drawing, history, and geography; emphasis to be placed upon the use of these units, scales, and standards as supervisory devices. Lectures, readings, and the investigation of some special problem in educational measurement. M.T.W.T., 9; 206 U.H.; 2 credit-hours.

Professor COFFMAN.

Prerequisite: Education 1 or equivalent. (Superintendents, principals and supervisors may, in the discretion of the instructor, be admitted into the course without the prerequisite.)

*S 41. VOCATIONAL EDUCATION.—A survey of the field of vocational education and vocational guidance; analysis and interpretations of typical institutions offering commercial, industrial, agri-

cultural and domestic curriculums and a critical summary of legislation for vocational education. Lectures, readings and reports. M.W.T.F., 11; 202 L.H.; 2 credit-hours. Professor JOHNSTON.

Prerequisite: Education 1 or equivalent. (Superintendents, principals, and supervisors may in the discretion of the instructor be admitted to the course without the prerequisite.)

Equivalent: Education 41.

*S 43. MENTAL TESTS.—Laboratory drill in the technique of mental tests, including tests of sensory capacities; attention; memory; learning; suggestibility; inventiveness; and the like; and systems of tests for diagnosis of mental age; general intellectual status; mental retardation; etc. Text: Whipple's *Manual of Mental and Physical Tests.* T.T., 10-12; 417 U.H.; 1 credit-hour. Associate Professor WHIPPLE.

Prerequisite: Education 25 or equivalent and the consent of the instructor.

*S 44. HISTORY OF INDUSTRIAL AND VOCATIONAL EDUCATION.—The development of the theory and practice of industrial training; its relation to general school education; brief survey of earlier historic movements and the contribution of the educational classics; special emphasis on the development of industrial training in America, agricultural and industrial high schools, secondary and higher technical schools, continuation schools. W.T.F., 3; 103 L.H.; 1½ credit-hours. Mr. RUGG.

Prerequisite: Education 2 or its equivalent.

COURSES FOR GRADUATES

*S 106. HIGH SCHOOL GOVERNMENT.—Legal provisions. A study of the various theories of student control; supervision and inspection. M., 4-6; 103 L.H.; ½ graduate unit. Professor HOLLISTER.

Prerequisite: Graduate standing.

*S 119.—SEMINAR IN ELEMENTARY EDUCATION: THE ELEMENTARY CURRICULUM.—The administration of the elementary curriculum; its origin and development; principles underlying elementary curriculums. Tu., 4-6; 103 L.H.; ½ graduate unit. Professor COFFMAN.

Prerequisite: Graduate standing.

*S 125. SEMINAR IN EDUCATIONAL PSYCHOLOGY.—Th., 4-6; 103 L.H.; ½ graduate unit. Associate Professor WHIPPLE.

Prerequisite: Graduate standing.

*S 127. High School Curriculums.—The problem of curriculum organization and of special methods in the high school, including comparisons with foreign secondary school systems. W., 4-6; 103 L.H.; ½ graduate unit. Professor Johnston.

Prerequisite: Graduate standing.

*S 129. The Theory of Educational Values.—An analysis of the problem of educational values with particular reference to the question of common elements in the elementary and secondary programs. Lectures, readings, and discussions. M.T., 1; 206 U.H.; ½ graduate unit. Professor Bagley.

Prerequisite: Graduate standing.

ENGLISH

Professors Dodge and Sherman; Assistant Professor Jones; Dr. Boyer; Mr. Woolbert and Mr. Curl.

S 2a. Survey of English Literature.—First half of the nineteenth century. Wordsworth, Coleridge, Lamb, Scott, Jane Austen, Byron, Shelley, Keats, Macaulay, Carlyle. Text: *Century Readings in English Literature* (Part II). M.T.T.F., 9; 307 U.H.; 2 credit-hours. Dr. Boyer.

Prerequisite: One year of college work or the equivalent.

Equivalent: First half of English 2. (Together with S 2b this course covers the work of English 2. To be credited as equivalent to English 2, S 2a and S2b should be taken simultaneously).

S 2b. Survey of English Literature.—Second half of the nineteenth century. Ruskin, Dickens, Thackeray, Tennyson, Browning, Arnold, George Eliot, Thomas Hardy, Rossetti, Stevenson, Morris. Text: *Century Readings in English Literature* (Part II). M.T.T.F., 11; 307 U.H.; 2 credit-hours.

Assistant Professor Jones.

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 2 (See note under S 2a).

S 23. Shakespeare.—Two Gentlemen of Verona, Midsummer Night's Dream, Richard III, Romeo and Juliet, Much Ado, Twelfth Night, Othello, Lear, Coriolanus, The Tempest. Text: *Tudor Shakespeare.* M.T.W.T.F., 3; 315 U.H.; 2½ credit-hours.

Professor Sherman.

Prerequisite: One year of college English or an equivalent.

Equivalent: English 23 (in part).

S 31. English Literature from 1688 to 1789.—M.T.W.T.F., 2; 202 L.H.; 2½ credit-hours. Dr. Boyer.

Prerequisite: three semesters of college work, including English 1-2 or 10-11.

Equivalent: English 31 (in part).

*S 8. Old English (Anglo-Saxon).—A careful study of the grammar, with specimens of prose. Text: Bright's *Anglo-Saxon* Professor Dodge.

Prerequisite: Two years of college English.

Equivalent: English 8.

S 25. Chaucer.—Selections from the *Canterbury Tales.* Text: Skeat's *Students' Chaucer.* M.T.W.T.F.S., 8; 218 L.H.; 3 credit-hours. Assistant Professor Jones.

Prerequisite: Two years of college work or equivalent.

Equivalent: English 25.

*S 35. The Pre-Shakespearian Drama.—A study of the mediaeval and of the sixteenth century drama, with special reference to Udall, Sackville and Norton, Lyly, Greene, Peele, Kyd, and Marlowe. Text: The Everyman *Elizabethan Drama.* M.T.W.T.F., 9; 110 L.H.; 2½ credit-hours, Professor Dodge.

Prerequisite: Two years of college work.

Equivalent: English 35 (in part).

*S 101. Research in Special Periods.—Individual conferences arranged with graduate students engaged upon definite pieces of investigation. Professors Dodge and Sherman; Assistant Professor Jones.

*S 138. The Romantic Movement in England.—Lectures, extensive reading, theses, conferences. M.T.W.T.F., 2; 218 L.H.; one unit. Professor Sherman.

Prerequisite: Graduate standing or the consent of the instructor.

Equivalent: One semester of English 138.

RHETORIC

S 1. Rhetoric and Themes.—Review of the principles of structure; grammar; punctuation; the sentence; the reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: Woolley's *Handbook of Com-*

position and Scott and Denney's *Paragraph Writing.* M.T.W.T. F.S., 10; 308 U.H.; 3 credit-hours. Mr. Curl.

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S 2. Rhetoric and Themes.—Argumentation, narration, and description. Four short themes a week, with one or two long briefs and long arguments. Oral and written exercises. Text: Scott and Denney's *Paragraph Writing.* M.T.W.T.F.S., 11; 308 U.H.; 3 credit-hours. Mr. Curl.

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 2.

PUBLIC SPEAKING

S 1. Oral Expression.—Theory and practice of vocal methods and platform manner, both for public address and oral interpretation of literature. M.T.T.F., 8; 320 U.H.; 2 credit-hours.

Mr. Woolbert.

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

S 9. Interpretive Reading.—A study of various types of literature from the point of view of oral expression; practice in interpreting chosen selections. M.T.T.F., 9; 320 U.H.; 2 credit-hours. Mr. Woolbert.

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Rhetoric 8.

S 10. Special Problems in the Teaching of Oral English.—Primarily for high-school teachers. M.W., 10; 320 U.H.; 1 credit-hour. Mr. Woolbert.

Prerequisite: The consent of the instructor.

ENTOMOLOGY

Assistant Professor Folsom, Mr. Peterson

S 1. General Field and Laboratory Course.—Planned to meet the needs of high-school teachers. Covers the most essential facts of entomology, emphasizing those of economic importance. Lectures, laboratory studies, and field observations. Text: Folsom's *Entomology with Reference to its Biological and Economic Aspects.* (Blakiston.) T.W.T.F., 1, 2; 405 N.H.; 2 credit-hours.

Assistant Professor Folsom.

*S 2. Advanced Course.—Instruction in several lines of advanced entomological study to meet the purposes of the individual student. Arrange; 405 N.H.; 2 or 3 credit-hours.

Assistant Professor Folsom.

S 3. Economic Entomology.—In the laboratory the student learns to recognize our common injurious insects in all their stages of development; in the field he gains a personal knowledge of their injurious activities. The lectures summarize the important facts relating to each insect pest, with special consideration of the most approved methods of control. M.T.W.T.F., 1, 2, and two additional hours; 408 N.H.; 3 credit-hours. Assistant Professor Folsom.

Equivalent: Entomology 4.

*S 4. Advanced Economic Entomology.—Personal work under direction on assigned problems in economic entomology, to prepare advanced students for immediate service as state and government entomologists. Those taking this course will be associated with the current operations of the State Entomologist's Office in a way to give them the advantage of practical experience in the economic field. Arrange; Ent. Building; 3 credit-hours.

Professor Forbes, Assistant Professor Folsom.

Prerequisite: 15 hours' credit in general and economic entomology.

Equivalent: Entomology 14.

FRENCH

(See Romance Languages.)

GERMAN

Dr. Held (Associate Professor of German in Miami University), Dr. Poor, Dr. Koller, Dr. Barto, Mr. Zucker.

S 1. Beginners' Course.—Section A: M., 9; TW.T.F., 8, 9; 207 U.H.; section B: M.T.W.T., 10, 11; F., 10; 211 L.H.; 4 credit-hours. Text: Gohdes and Buschek's *Sprach-und Lesebuch,* Henry Holt & Co. Dr. Held, Mr. Zucker.

Equivalent: German 1.

S 2. Intermediate Course.—(Open to those who have had German 1 of the regular university year or an equivalent.) M.T.W.T.F.S., 10; 207 U.H.; 3 credit-hours. Dr. Barto.

Equivalent: German 3 (in part).

S 3. Prose Reading.—Narrative prose; sight translation; composition. (Open to those who have had German 3 of the regular university year or an equivalent.) M.T.W.T.F.S., 9; 205 L.H.; 3 credit-hours. The first text: *Zwei Maerchen,* Oxford University Press. Dr. Poor.

Equivalent: German 4 (in part).

S 4. Readings from the Classics.—Sudermann's *Teja* (D. C. Heath & Co.) will be the first text. (Open to those who have had German 4 of the regular university year or an equivalent.) T.W.T.F., 11; 207 U.H.; 2 credit-hours. Dr. Barto.

Equivalent: German 5 (in part).

S 5. Prose Composition and Conversation.—Translation of ordinary prose into German; study of idiomatic constructions; practice in free composition and conversation. M.T.W.T., 10; 215 L.H.; 2 credit-hours. Dr. Koller.

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 16.

S 6. Modern Drama.—Rapid reading of dramas by Kleist, Hebbel, and others. M.T.W.T., 11; 215 L.H.; 2 credit-hours. Dr. Koller.

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 24 (in part).

(S 7. Modern Fiction.—Four times a week; 2 credit-hours; not given in 1915. *To be given in 1916.*)

S 9. Teachers' Course.—Place, aim, and scope of the study of German in the high school; discussion of methods and the chief difficulties in teaching German. Observation work in the beginners' course. (Open to those who have taught German or to those who have had three years of university German or an equivalent.) W.F., 9; 211 L.H.; 1 credit-hour. Dr. Held.

Equivalent: German 25 (in part).

S 10. Goethe's Faust.—*Prerequisite:* Three years of university German or an equivalent. T.W.T.F., 8; 205 L.H.; 2 credit-hours. *Equivalent:* 19a. Dr. Poor.

(*S 11. History of German Literature Since the Reformation.—Four times a week; 2 credit-hours. *Prerequisite:* three years of university German or an equivalent. Open also to graduate stu-

dents. *Equivalent:* German 11 (in part). Not given in 1915. *To be given in 1916.*)

(*S 14. Elementary Readings in Middle High German.—Twice a week; 1 credit-hour. *Prerequisite:* three years of university German or an equivalent. Open also to graduate students. Not given in 1915. *To be given in 1916.*)

*S 15. The Classical Period of Middle High German Literature.—Lectures, discussions, reports on assigned topics, reading of the most important works (not necessarily in the original). *Prerequisite:* three years of university German or an equivalent. Open also to graduate students (subject to the approval of the Executive Faculty). T.T., 9; 215 L.H.; 1 credit-hour. Dr. Koller.

Equivalent: German 26 (in part).

Note: Plans are under consideration for a German House where more advanced students could board and room together. A special Circular will be mailed upon application.

HISTORY

Associate Professor Lybyer, Professor Carter (Miami University), Professor Hormell (Bowdoin College).

S 1a. European History, 378-1300.—From the time of the Roman Empire, the early Christian Church and the German invasions, to the Crusades and the height of medieval civilization. An introductory course corresponding to the first one-third of History 1. M.T.W.T.F., 8; 311 L.H.; 2½ credit-hours.

Associate Professor Lybyer.

S 3b. American History, 1783-1861.—A general survey, corresponding for the period covered to History 3 as given during the regular university session. M.T.W.T.F., 10; 305 L.H.; 2½ credit-hours. Professor Carter.

COURSES FOR GRADUATES AND UNDERGRADUATES

(At least junior standing required.)

*S 16. The History of the West, 1750-1850.—Emphasis will be laid on the struggle for the Mississippi Valley in the eighteenth century, on the movement of population into the various physiographic regions of the West, and on the influence of this development upon national life. M.T.W.T.F., 11; 305 L.H.; 2½ credit-hours. Professor Carter.

Prerequisite: At least one college course in American history.

*S 20b. European Political History, 1870-1914.—With special reference to international relations and the events leading up to the great war. M.W.F., 9; 311 L.H.; 2 credit-hours.

Associate Professor Lybyer.

Prerequisite: At least one college course in European history.

*S 15b. The United States During the Period of Reconstruction.—An intensive study is made of: (a) the constitutional problems involved; (b) the political status of the negro and the factors resulting in his enfranchisement. M.T.W.T.F., 8; 305 L.H.; 2½ credit-hours. Professor Hormell.

Prerequisite: One college course in American history.

COURSES FOR GRADUATES

*S 101. Investigation of Selected Topics.—Personal conferences with graduate students who desire guidance in research. If feasible, a weekly general conference will be held. Arrange.

Associate Professor Lybyer.

HOUSEHOLD SCIENCE

Miss Stanton, Miss Hope (Boston), Miss Linder

Foods.—The work offered in foods is of two grades: (a), that designed for those who have studied or taught household science and wish to prepare themselves to teach it in high schools; (b), advanced work dealing with the general subject of nutrition.

S 1. A study of the sources and cost of foods, the cooking of various types of foods, and the combinations of food as shown in the planning and service of meals. Text: Bevier and Van Meter's *Selection and Preparation of Food* (Whitcomb & Barrows). Reference work. Laboratory, M.W.F., 10, 11; Lecture, Tu., 10; Quiz, Th., 10; W.H.; 1½ credit-hours. Laboratory Fee, $2.00.

Miss Stanton.

S 2. A study of the relative nutritive value of foods; the methods of estimating dietetic values; the relation of foods to the human body. Laboratory, T.Th., 8, 9; Lecture, M., 8; Quiz, W.F., 8; W.H.; 1½ credit-hours. Laboratory Fee, $2.00. Miss Stanton.

Prerequisite: A year's work of college rank with foods; a year of general chemistry; a course in general physiology.

S 4. Clothing.—A study of the textiles used in clothing; discussion of the cost and care and clothing; demonstrations in the use of patterns; drafting; laboratory work in the making of under-

garments, a shirtwaist, and a cotton dress. Lecture and discussion, M., 2; Laboratory and demonstration, W.F., 1, 2, 3; W.H.; 2 credit-hours. Miss Hope and Miss Linder.

S 5. Millinery.—Demonstrations and laboratory work in designing and construction of wire, buckram, and cape net frames; the covering with velvet and straw. Demonstrations and laboratory, Th., 1, 2, 3; W.H.; ½ credit-hour. Miss Linder.

S 6a. Costume Design.—Lecture and laboratory work. Based on the study of appropriate dress. Proportion of parts, outline of figure and color harmony are studied. M.W.F., 10, 11; first four weeks; W.H.; ½ credit-hour. Miss Hope.

S 6b. House Decoration and Furnishing.—Lecture and laboratory work. History of furniture; perspective drawing of rooms; color schemes; weaving. M.W.F., 10, 11; last four weeks; W.H.; ½ credit-hour. Miss Hope

LATIN

(See Classical Department)

LIBRARY SCIENCE

(See page 16)

MANUAL TRAINING

Mr. Park, Advisor; Mr. Haas, Mr. Duncan.

The courses in Manual Arts have been arranged to satisfy the needs of three classes of students who attend the Summer Sessions; first, superintendents, principals, and teachers in small schools who pursue the work with the idea of either teaching or supervising it in their schools; second, manual arts teachers and supervisors who take the courses to increase their knowledge and experience, thus enabling them to command higher salaries; and, third, to satisfy those students in other courses who take the work to enrich their experiences.

S 1. Industrial Education.—History and theory of industrial education; a study of typical schools and systems of manual arts, leading to a better understanding of the aims and methods of various schemes for the promotion of industrial education in this country; organization of work; and, a study of equipments and materials. M.T.W.T.F., 8; Lecture Room, Wood Shops; 2½ credit-hours. Mr. Park.

S 2. Woodworking.—(A course for teachers in the 7th and 8th Grades and high schools.) Includes a study of tools—as uses,

names of parts, adjustments, care of, and how to sharpen; the making of important joints used in wood construction and the application of these joints to the making of useful and interesting projects; the designing and making of arts and crafts furniture; notebook work, covering talks, papers, problems, etc.; strenuous work at the bench. M.T.W.T.F., 2-5; Wood Shop; 3 credit-hours. Shop Fees $5. Mr. Park and Mr. Duncan.

S 3. Woodworking.—(A course for teachers who have completed S 2). Advanced work in cabinet making; designing and making furniture; technology of woodworking; also, some work in wood turning. M.T.W.T.F., 9-12; Wood Shop; 3 credit-hours. Shop Fee $5. Mr. Park and Mr. Duncan.

S 4. Elements of Drafting.—Required of all engineering students; consists of freehand and mechanical lettering; practise in the use of instruments on standard set of working drawing plates; tracing, machine sketching, isometric and oblique projection, and perspective. Text: Miller's *Mechanical Drafting.* M.T.W.T.F., 8-11; 303 Transportation Building; 4 credit-hours.
Mr. Crane.

S 5. Descriptive Geometry.—Problems relating to the point, line, and plane; the properties of surfaces; intersections and developments of surfaces. Text: Miller's *Descriptive Geometry.* M.T.W.T.F., 8-11; 303 Transportation Building; 4 credit-hours.
Mr. Crane.

(The courses given under Art and Design are of interest to students of Manual Arts.)

S 6. Pattern Shop.—The care and use of tools; the construction of patterns, core-boxes, and the use of machines such as are found in modern pattern shops. M.T.W.T.F., 9-12; Wood Shop; 3 credit-hours. Mr. Duncan.

S 9. Art Metal Work.—Includes the use and care of tools; hammering bowls, trays, and many useful articles from sheet copper, brass, and silver; work involving such processes as raising, annealing, filing, sawing or piercing, etching, repousse, enameling, and coloring; the making of art lamps, lanterns, candlesticks, boxes, furniture fittings, etc. Design is considered in relation to the project under construction. M.T.W.T.F., 9-12; Machine Shop; 2½ **credit-hours. Shop Fee $3.** Mr. Haas.

S 10. JEWELRY.—Instruction is offered in the making of buckles, fobs, chains, necklaces, pendants, rings, setting of stones; casting silver into useful shapes; polishing and finishing of metals; coloring by chemical and electrical methods. Design is considered in relation to the project under construction. M.T.W.T.F., 2-5; Machine Shop; 2½ credit-hours. Shop Fee $3. Mr. HAAS.

MATHEMATICS

Assistant Professor SHAW, Dr. WAHLIN, Dr. KEMPNER, Mr. WILSON, Mr. ZEIS

S 2. COLLEGE ALGEBRA.—(Equivalent to the regular university course). Text: Rietz and Crathorne's *College Algebra* (Henry Holt and Co.) M.T.W.T.F., 10; 419 N.H.; 3 credit-hours. Dr. WAHLIN.

Prerequisite: 2½ units entrance mathematics.

S 4. PLANE TRIGONOMETRY.—(Equivalent to Mathematics 4). Text: Kenyon and Ingold's *Trigonometry,* (The Macmillan Co.) M.T.W.T.F., 11; 434 N.H.; 2 credit-hours. Mr. ZEIS.

Prerequisite: 2½ units entrance mathematics.

S 6. ANALYTICAL GEOMETRY.—(Equivalent to Mathematics 6.) An introductory course in plane and solid analytic geometry. Text: Dowling and Turneaure's *Analytic Geometry,* (Henry Holt). M.T.W.T.F., 8 and 9; 432 N.H.; 5 credit-hours. Dr. KEMPNER.

Prerequisite: Math. 2 and 4.

S 7. DIFFERENTIAL CALCULUS.—(Equivalent to Mathematics 7.) Course in beginning calculus. Text: Townsend and Goodenough's *Essentials of Calculus,* (Henry Holt and Co.) M.T.W.T.F., 8 and 9; 431 N.H.; 5 credit-hours. Mr. WILSON.

Prerequisite: Math. 6.

S 9. INTEGRAL CALCULUS.—(Equivalent to Mathematics 9.) Text: Townsend and Goodenough's *Essentials of Calculus,* (Henry Holt and Co.) M.T.W.T.F.S., 9; A in 425 N.H.; B in 434 N.H.; 3 credit-hours. Professor SHAW, Sec. A; Mr. ZEIS, Sec. B.

Prerequisite: Math. 7.

*S 10. THEORY OF EQUATIONS AND DETERMINANTS.—(Equivalent to Mathematics 10.) Some of the fundamental properties of algebraic equations in one unknown; solutions of systems of simultaneous equations; system of linear equations; fundamental properties of determinants. Text: Dickson's ***Elementary Theory of Equations,***

(Wiley and Sons Co.) M.T.W.T.F.S., 9; 419 N.H.; 3 credit-hours. Dr. WAHLIN.

Prerequisite: Math. 6.

*S 16. DIFFERENTIAL EQUATIONS.—(Equivalent to Mathematics 16.) General elementary ordinary and partial differential equations, including properties, methods of integration, and applications particularly to physics and chemistry. Text: Cohen's *An Elementary Treatise on Differential Equations,* (Heath and Co.) M.T.W.T.F.S., 10; 425 N.H.; 3 credit-hours. Assistant Professor SHAW.

Prerequisite: Math. 8 or 9.

MECHANICS, THEORETICAL AND APPLIED

Mr. SEELY, Mr. ENSIGN, Mr. VALLANCE.

S 10. HYDRAULICS.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observation and the measurement of pressure, velocity, and flow, in power and efficiency, and in the determination of experimental coefficients. Hoskin's *Text-book on Hydraulics.* M.T.W.T., 1; 202 E.H.; T.T., 8-10; Hyd. Lab.; 3 credit-hours. Mr. VALLANCE.

Prerequisite: Theoretical and Applied Mechanics 21.

NOTE: Arrangements may be made to use the facilities of the hudraulic laboratory for special experimental work during the summer session.

S 14. ELEMENTS OF MECHANICS.—The principles of kinematics, kinetics, and statics and their application. Morley's *Mechanics for Engineers.* (For Architects and others who have not taken the calculus.) M.W.F.S., 8, and T.T., 8-10; 202 E.H.; 4 credit-hours. Mr. ENSIGN.

Prerequisite: Mathematics 2, 4.

S 20. ANALYTICAL MECHANICS.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* M.T.W.T.F.S., 10; 202 E.H.; 3 credit-hours. Mr. ENSIGN.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 21. ANALYTICAL MECHANICS.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* M.T.W.T., 10; 208 E.H.; 2 credit-hours. Mr. SEELY.

Prerequisite: Mathematics 9 and Theoretical and Applied Mechanics 20.

S 25. Resistance of Materials.—The mechanics and properties of materials used in construction, experiments in the testing laboratory, problems in the application of principles. Merriman's *Mechanics of Materials.* M.T.W.T.F.S., 11; 208 E.H.; M.W., 8-10; L.A.M; 4 credit-hours. Mr. Seely, Mr. Vallance.

Prerequisite: Mathematics 9, Theoretical and Applied Mechanics 20.

MUSIC

Assistant Professor Smith, Miss Swan.

S 1. Musical History.—Ancient and medieval music; early church music; polyphonic music organum discant and Fauxbourdon; the evolution of the oratorio, music-drama, and the beginnings of instrumental music. Collateral reference work and note books are required. M.T.W.T.F., 9; 126 U.H.; 2 credit-hours. Assistant Professor Smith.

S 2. High School Music.—Based upon standard compositions both vocal and instrumental; chorus singing; general theory and methods of teaching. M.T.W.T., 10; 126 U.H.; 2 credit-hours (School of Music). Assistant Professor Smith.

S 3. Harmony.—Summary and drill in scales and keys, intervals, triad construction and connection; derivation and figured bass from given melody, harmonization in two clefs. M.T.T.F., 11; 126 U.H.; 2 credit-hours. Miss Swan.

S 4. Advanced Course.—Drill in one, two, three, and four part reading; suitable exercise for breath control, enunciation and phrasing. M.T.T.F., 2; 126 U.H.; 1 credit-hour (School of Music). Miss Swan.

S 5. Elementary Course.—Music notation; scale structure; ear and eye training; solfeggio. Tu.F., 3; 126 U.H.; no university credit.

Campus sings every Wednesday evening at 6:45, Auditorium steps.

PHYSICAL TRAINING

Athletic Coaching

Director Huff, Mr. Gill, Mr. Jones, Mr. Zuppke, Mr. Glimsted.

Note: Courses in Physical Training for men will continue through only 6 weeks. Not more than 5 credit-hours in physical

training may be counted for graduation in any one of the colleges of the University.

S 10. Baseball.—Theory and Practice in batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules; physical condition; methods of indoor practice. Lectures and practical work. M.T.W.T., 3-5; 1½ credit-hours. Director Huff.

S 11. Track and Field Athletics.—Instruction and practical demonstration in starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; practical talks on methods of preparing contestants for different athletic events; adaptations to individual peculiarities; rules of competition; study of physical condition, including endurance, speed, fatigue, and all means of training for condition; work is assigned for the promotion, management, and officiating of games and meets. Lectures and practical work. W.T.F.S., 10-12. 1½ credit-hours. Mr. Gill.

S 12. Basketball.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. Lectures and practical work. M.T.W.T., 1-3; 1½ credit-hours. Mr. Jones.

S 13. Football.

Theoretical:

a. Rules from the standpoint of coach, players, and officials.
b. Several styles of offense and defense with consideration of their special strengths and weaknesses.
c. Generalship and strategy.

Practical:

a. Training, conditioning, and players equipment.
b. Punting, drop kicking, place kicking, kick off, and forward passing.
c. Tackling dummy and charging sled.
d. Special drills for linemen, ends, and backs.
e. Following the ball, interference, and team work.
f. Fundamental plays, freak plays, and signal systems.

Lectures and practical work. M.T.F.S., 8-10. 1½ credit-hours. Mr. Zuppke.

S 14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S 10, S 11, S 12, or S 13. W.T., 9; ½ credit-hour. Mr. Glimsted.

Physical Training for Women

Miss Moulton

S 1. Plays and Games.—Designed for teachers who coach high-school girls or supervise grammar-school games. The course will include instruction in methods of varying the problems involved; the grading of games; team games for girls with especial reference to basket ball; the comparative values of the various rules used by girls' teams, (a) from the coach's point of view, (b) from the player's point of view; value of center ball, goal relay, and other team games in working up to basket ball; the training of the captain in her duties; training in team work; combination plays, guarding, various throws, etc. M.W.F., 9-11; 1 credit-hour.

S 2. Swimming.—Games, diving, "stunts", etc. M.T.W.T.F., 11, 2, 3, 4.

PHYSICS

Assistant Professors Knipp and Kunz; Messrs. Jones, Randolph, Nathanson and Bayley.

S. 2aI. General Physics Part 1.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. Text: Kimball's *College Physics*. M.W.F., 11; Lecture Room 119, Physics Building; 1½ credit-hours.

Assistant Professor Knipp, Mr. Jones.

Prerequisites: Plane geometry and high-school algebra; registration in Physics S 2b1. Plane trigonometry desired.

Equivalent: S 2a (I, II, III) together with S 2b (I, II, III) are equivalent to Physics 2a, 2b for the college year.

S 2bI. Introductory Laboratory Physics Part I.—A laboratory course in physical measurements on mechanics, properties of matter, etc., to accompany S 2aI. Text: Schulz's *Laboratory Manual*. M.W.F., 2-4; 212 Physics Building; 1½ credit-hours.

Mr. Jones, Mr. Bayley.

Prerequisite: Registration in Physics S 2aI.

Equivalent: See S 2aI.

S 2aII. General Physics Part II.—Experimental Lectures with recitations on electricity and magnetism. Text: Kimball's *College Physics*. T.T.S., 11; Lecture Room 119, Physics Building; 1½ credit-hours. Assistant Professor Knipp, Mr. Nathanson.

Prerequisites: See S 2aI.

Equivalent: See S 2aI.

S 2bII. Introductory Laboratory Physics Part II.—A laboratory course in electricity and magnetism to accompany S 2aII. Text: Schulz's *Laboratory Manual*. T.T., 2-4; S., 8-10; 212 Physics Building; 1½ credit-hours. Mr. Nathanson, Mr. Bayley.

Prerequisite: Registration in S 2aII.

Equivalent: See S 2aI.

[S 2aIII. General Physics Part III.—Lectures with experimental demonstrations and recitations. Topics treated will be heat, light and sound. Text: Kimball's *College Physics*. 1½ credit-hours. Given in 1914; not given in 1915; probably will be given in summer of 1916.

Prerequisite: Same as S 2aI.

Equivalent: See S 2aI.]

[S 2bIII. Introductory Laboratory Physics Part III.—A laboratory course in which the fundamental experiments in heat, light and sound are performed. Text: Schulz's *Laboratory Manual*. 1½ credit-hours. **Not given in 1915.**

Prerequisite: Registration in Physics S 2aIII.

Equivalent: See S 2aI.]

S 4. Electrical and Magnetic Measurements.—An advanced laboratory course with discussions, recitations and reports. Students in electrical engineering whose work is irregular can do the first semester of electrical measurements in the Summer Session and finish with the class during the second semester. No text required. M.T.T.F., 1-4; 112 Physics Building; 2 credit-hours.

Mr. Randolph.

Prerequisite: A course in general physics and calculus.

Equivalent: First semester of Physics 4.

S 15. Electricity and Magnetism.—Lectures, recitations and laboratory work. The course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses in general physics. The apparatus and laboratory methods used call for high accuracy. Text:

Brooks & Poyser, *Magnetism and Electricity.* M.W., 8; F., 1-4; 108 Physics Building; 1½ credit-hours. Mr. Randolph.

Prerequisite: A course in general physics.

Equivalent: Physics 15 (in part).

[S 16. Heat.—Lectures and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, expansion, vapor pressure, etc. This is an intermediate course recommended to students who have already had a course in general physics and desire a more extended knowledge of heat. Text: Edser's *Heat for Advanced Students.* 1½ credit-hours. Given in 1914; not given in 1915; probably will be given in summer of 1916. *Prerequisite:* A course in general physics. *Equivalent:* Physics 16 (in part).]

S 17. Light.—A course of lectures and recitations on reflection, refraction, interference, diffraction and polarization, followed by laboratory experiments on these phenomena, and the theory and use of optical instruments, such as telescopes, microscopes, refractometers, prism and grating spectroscopes, interferometers, etc. Text: Edser's *Light for Students.* M.W., 8; F., 1-4; 313 Physics Building; 1½ credit-hours. Mr. Nathanson.

Prerequisite: A course in general physics. See instructor in special cases.

Equivalent: Physics 17 (in part).

S 18. Teachers' Course.—This course is in two parts. Part I consists of discussions of methods of organizing laboratory work, quizzes and class demonstrations, criticisms of high-school textbooks, principles of selecting and ordering apparatus, etc. Part II consists of practical laboratory manipulation, such as glass blowing, minor repairs of apparatus, processes of preparation of direction sheets, etc. T.T., 8; 208 Physics Building; 1 credit-hour.

Mr. Jones.

Prerequisite: A course in general physics, or teaching experience in physics.

Equivalent: Physics 18 (in part).

S 19. Problems in General Physics.—This is exclusively a problem course in mechanics, heat, electricity and magnetism, and sound and light, and is intended to supplement courses S 2aI, S 2aII, and S 2aIII. Problems are assigned and the solutions are critically discussed in class. For the summer of 1915 the assign-

ments will be in mechanics, electricity and magnetism. Text: Shearer's *Problems in General Physics.* W.F., 9; 104 Physics Building; 1 credit-hour. Mr. RANDOLPH.

Prerequisite: A course in general physics.

S 21. RECENT ADVANCES IN PHYSICAL SCIENCE.—See S 126. Physics Colloquium.

*S 127. ELECTRON THEORY OF ELECTRICITY AND MATTER.—A course of non-mathematical lectures on the modern theories of electricity and matter, with discussions of applications to the various phenomena of physics and chemistry. References will be made to the standard treatises and papers of Thomson and others and registered graduate students will be expected to make written reports on these. The course is open to those who have had a course in general physics, and particularly to those expecting to teach the elements of physics and chemistry. Three lectures a week. M.W.F., 4-5; Room 302 Physics Building; 1½ credit-hours (½ graduate unit). Assistant Professor KUNZ.

*S 31. SPECIAL PROBLEMS IN ADVANCED PHYSICAL MEASUREMENTS.—Special laboratory problems such as the accurate determination of the value of H, the horizontal component of the earth's magnetic intensity; of the self-induction, L, of a coil; of the capacity, C, of a condenser in absolute measure; the calibration of a bridge wire; the determination of e/m and v of the electron; the adjustment of an electrometer and the determination of its capacity, etc. Text: *Various Laboratory Manuals.* 1 or 2 credit-hours. Arrange time. Assistant Professor KNIPP.

Prerequisite: A course in general physics, calculus.

*S 126.—PHYSICS COLLOQUIUM.—Weekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems. A few of these papers are on investigations in progress in the laboratory and experimental demonstrations are used. Attendance is expected of all graduate students. Undergraduates who are especially interested in physics as teachers or otherwise, are advised to attend. Thursday, 6:45-8:00 p. m.; 201 Physics Building.

Assistant Professors KNIPP, KUNZ.

The plan for the summer of 1915 is to devote three of these colloquium periods to popular lectures, illustrated by experiments, on the more recent and important advances in physical science.

These lectures are by members of the physics instructional staff and are open to all students in the Summer Session interested. The subjects and dates follow:

Liquid Air, Thur., July 1, 6:45; 100 Physics Building.

Mr. JONES.

X-Rays, Thur., July 15, 6:45; 100 Physics Building.

Mr. RANDOLPH.

Cathode Rays—the Electron, Thur., July 29, 6:45; 100 Physics Building. Assistant Professor KNIPP.

A physics exhibit will be held immediately following the lecture on July 29. The laboratories, research rooms, and the department shop will be open for inspection. It is planned to have a number of instructive experiments on exhibition.

*S 131. INVESTIGATION OF SPECIAL PROBLEMS.—This course is intended for students who expect to work for advanced degrees. The work done should show originality in method, or should contribute new data in experimental investigation.

Assistant Professors KNIPP, KUNZ.

Prerequisite: Registration in Graduate School. See instructor.

*S 132. MATHEMATICAL PHYSICS.—Selected chapters in electrodynamics. Lectures and collateral reading. These lectures will involve the use of calculus and differential equations. Special chapters of the subject are treated more or less thoroughly and reference made for further reading. Two times a week. T., 4-5; Th., 4-6; Room 302 Physics Building; 1 graduate unit.

Assistant Professor KUNZ.

*S 133. SEMINARY AND THESIS.—

Assistant Professors KNIPP and KUNZ.

Prerequisite: Registration in Graduate School. See instructor.

POLITICAL SCIENCE

S 1. AMERICAN GOVERNMENT.—Historical development, theory, organization, powers, limitations and practical workings of the national government in the United States. Lectures, discussions, and collateral reading. Text: Beard, *American Government and Politics* (Macmillan Co.) M.T.W.T.F., 1; 317 L.H.; 2½ credit-hours.

Mr. STORY.

Prerequisite: Thirty hours of University work.

Equivalent: Political Science 1 (in part).

S 3. State and Local Government.—Powers, obligations and rights of the states in the Federal Union; development of state constitutions; organization and functions of state, rural and municipal governments; party organization and political methods. Lectures, discussions, and collateral reading. Text: Beard, *American Government and Politics* (Macmillan Co.) M.T.W.T.F., 2; 317 L.H.; 2½ credit-hours. Mr. Story.

Prerequisite: Thirty hours of University work.

Equivalent: Political Science 3 (in part).

S 6. International Law.—Nature and development of international law; organization of the diplomatic service; methods of diplomacy; the making and enforcement of treaties; sovereignty and independence of States; laws of war; rights and duties of neutrals. Open to graduates and advanced undergraduates. M.T.W.T.F., 10; 317 L.H.; 2½ credit-hours. Professor Hormell.

ROMANCE LANGUAGES

FRENCH

Associate Professor Carnahan, Mr. Carry

S 1. Elementary Course.—Pronunciation, grammar, composition, reading of easy texts. Giese's *Graded French Method* (Henry Holt & Co.) will be the introductory textbook. M., 11; T.W.T.F., 8, 11; 211 L.H.; 4 credit-hours. Mr. Carry.

Equivalent: French 1 (Elementary French, first semester).

S 1a. Elementary Course (continued).—Open to capable students by special arrangement with the instructor. 2-4 credit-hours. Associate Professor Carnahan.

Prerequisite: French 1 (Elementary French, first semester), S 1, or one year of high-school French.

Equivalent: French 1, second semester (in part or full credit).

S 2. Reading of Modern French.—Rapid reading of modern authors, composition, conversation. Texts: Comfort's *French Prose Composition;* Loti's *Pêcheur d'Islande;* Merimée's *Colomba;* Erckman-Chatrian's *Le Juif Polonais;* Bazin's *Les Oberlé;* Hugo's *Ruy Blas;* Scribe's *Bataille de Dames.* M.T.W.T.F.S., 9; 117 L.H.; 3 credit-hours. Associate Professor Carnahan.

Prerequisite: One year of university French or its equivalent.

Note: Students securing a grade of 85 or more who desire to earn one additional credit-hour so as to make this course the

equivalent of French 2 first semester of the regular university course, may do so upon approval of the instructor and by fulfilling additional requirements of assigned work. Such additional credit must, however, be indicated at the time of registration.

S 3. Composition and Conversation.—Practice in speaking and writing simple French. Talks by the instructor in French on the life and customs of the French people. As a basis for conversation Talbot's *Le Français et sa patrie* (Benj. H. Sanborn, publisher) will be used. M.W., 10; 117 L.H.; 1 credit-hour. Mr. Carry.

Prerequisite: The approval of the instructor. A good knowledge of French grammar and an ability to read ordinary French prose will be the basis of his judgment.

S 8. Modern French Drama.—Rapid reading of modern authors. Collateral reading. T.T., 2; 117 L.H.; 1 credit-hour.

Associate Professor Carnahan.

Prerequisite: Two years of university French or an equivalent.

*S 100. Seminar.—An opportunity for graduate work will be afforded for properly qualified students.

Associate Professor Carnahan.

SPANISH

Mr. Soto.

S 1. Elementary Course.—Grammar, reading of easy texts. Text: Coester's *A Spanish Grammar.* M., 11; T.W.T.F., 8, 11; 117 L.H.; 4 credit-hours. Mr. Soto.

Equivalent: Spanish 1 (first semester).

S 2. Conversation and Composition.—Conversation; reading of modern prose. The vocabulary of everyday life is emphasized. Commercial correspondence. T.T., 9; 211 L.H.; 1 credit-hour.

Mr. Soto.

Prerequisite: One year of university Spanish or an equivalent.

SOCIOLOGY

Professor Hayes

S 1. The Principles of Sociology.—Analysis of the realities that make up the life of a people, the modes of change to which they are subject, and the causes by which they are affected, with

practical applications to our own time and country. M.T.W.T.F., 11; 306 L.H.; 2 credit-hours. Professor Hayes.

Prerequisite: Junior standing or equivalent preparation; should if possible be preceded or accompanied by elementary psychology and the principles of economics.

Note: Courses S 1 and S 5 cover the ground of Course 1.

S 5. Charities and Correction.—The effects, causes, prevention, and treatment of poverty and crime. T.W.T.F., 2; 306 L.H.; 2 credit-hours. Professor Hayes.

Prerequisite: Sophomore standing or equivalent preparation.

S 7. The Social Problems of the Rural Community.—W.F., 3; 306 L.H.; 1 credit-hour. Professor Hayes.

ZOOLOGY

Professor Galloway, (James Millikin University) and Mr. Henderson (James Millikin University)

S 1. General Zoology.—An introductory view of the subject including textbook, lectures, laboratory, and field work. General activities and structures of animals; the variety of animal forms; where animals are found and why; how one may learn to know animals; the measure of success among animals; how they have become adapted to their surroundings; the history of the individual from the egg to maturity; how, and what, animals inherit; influence of animals on human life; man's influence on animals; the growth of man's knowledge of animals; the great discoveries. Lectures and recitations. M.W.F., 9; Laboratory, M.T.W.T.F., 10-12; 312 N.H.; 4 credit-hours. Laboratory Fee $2.00.

Professor Galloway and Mr. Henderson.

No prerequisites.

S 19. Teachers' Course.—Lectures, assigned readings, reports, discussions. Including the relation of life sciences to other subjects; educational value of the life sciences, direct and indirect; the scientific method and its application to the teaching of biology; methods that have been used in teaching biology, historical and critical; illustrations of the use of the scientific method; how to secure the carrying over of the scientific spirit into the problems of life; tests of efficiency in teaching zoology; the particular values of library, classroom, field, and laboratory for the high-school course; teaching value of economic aspects of biology, as agriculture, home

economics, etc.; outline of courses suitable for secondary education; the library, and the selection of books, periodicals, etc.; the field, and how to utilize the outdoors; how to conduct excursions; the laboratory, its equipment, and how to arrange and use it; demonstrations of practical methods of work. T.Th., 9; 229 N.H.; 1 credit-hour. Professor Galloway.

Prerequisite: Open to teachers of zoology, to those having had a course in zoology, or to those taking the course in General Zoology. See Course S 27 for practical laboratory and field guidance.

S 27. Elementary Zoological Methods.—Laboratory, field work, and discussions. This course is designed to give practical aid, to high-school teachers of limited experience, in using the laboratory and field. It will include practical work in collecting animals in the field, in identifying them, in cultivating them in the laboratory, in preserving them; the making of microscopic mounts of whole organisms or of organs for class demonstrations; the making of hand sections and of teased and macerated tissues, and of simple microtome sections; simple staining and mounting, etc.; how to make gross dissections for laboratory demonstrations; use of laboratory apparatus; discussion of relative values of different laboratory materials for illustrative purposes; the making of charts, diagrams, and illustrative material generally. T.Th., 2-4; 312 N.H.; 1 credit-hour. Laboratory Fee $2.00. Mr. Henderson.

Prerequisite: Open to those who have had a course in zoology or are taking General Zoology. May be taken separately, or as the laboratory portion of S 19, and in connection with it.

*S 21. Introduction to Zoological Research.—Investigation of topics, usually repeating the work of earlier investigators, on the morphology, life-history, or interrelations of invertebrate animals. Laboratory; literature; conferences; report. Arrange.
Professor Galloway.

Prerequisite: One year of college work in Zoology and Senior standing, or its equivalent.

S 41. Sex and Education.—Lecture course, discussing the influence of the sex development of the pupil on his education; biology of sex; effects upon physical, mental, and emotional development; social and moral bearings of sex; the role of the various social agencies in establishing sound sex attitudes and ideals; degree to which instruction is advisable; how the teacher can aid the home

in this regard; the kind of instruction suitable to different ages of childhood. W., 3; 228 N.H.; ½ credit-hour.

Professor GALLOWAY.

Open to teachers.

University of Illinois Location

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis Railroads. The cities of Urbana and Champaign have together a population of 24,000.

The institution was incorporated February 28, 1867, under the name, the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred thirty-five acres, besides a farm of about eight hundred fifty acres. The buildings at Urbana are forty-five in number, chief of which are the Agricultural Building, the Agronomy Building, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the Library Building, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, the Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop, Foundry, Commerce Building, Transportation Building, the New Armory, and Stock Judging Pavilion. Funds have been appropriated and a site chosen for the School of Education Building. Additions are being made to the Chemistry Building and the Commerce Building.

Libraries

The University library, at Urbana, contains 300,000 volumes, and subscribes for 1,400 periodicals; the current numbers of many

of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 8,200 volumes and 35,000 pamphlets.

The library is housed, for the most part, in the library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

Athletics

Although both the men's and women's gymnasium will be used in some parts of the regular class work in Physical Training, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gmnasiums are well equipped. Each contains swimming pool, shower, and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts upon the University campus are open to the student body. The general athletic fields will be open to the students. The golf links, which are in the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, base ball clubs, etc.

Play Ground

Miss Gertrude Moulton, Director of Physical Training for Women, will offer a course designed for teachers who coach high-school girls or supervise grammar-school games.

Board and Lodging

House for German Students

An innovation on the part of the German Department at the coming Sumemr Session of the University of Illinois will be a German house. A pleasant sorority house has been rented which will offer rooms for twenty young women. At the tables instructors in the Department will preside and lead an informal conversation. A limited number of men may also secure board. The chaperon

is a German woman, and in general a German atmosphere will prevail.

Since only a limited number can be accommodated in this club, it is desirable that those who wish to room at the house make reservations as early as possible. Until May 1 out-of-town applicants will be given the preference; after that date regular University students will be given an opportunity. Rooms will be five dollars per month ($10.00 for the term) and board $4.50 per week.

Inquiries should be addressed to Dr. C. M. Poor or Mr. A. E. Zucker in care of the German Department of the University of Illinois.

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board can be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or

W. C. Bagley, Director
W. S. Miller, Secretary
Room 203, University Hall,
Urbana, Illinois.

The University of Illinois

Summer Session

June 19 to August 11, 1916

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UNIVERSITY OF ILLINOIS

Edmund Janes James, Ph.D., LL.D., President of the University.

William Chandler Bagley, Ph.D., Director of the School of Education; *Director of the Summer Session.* (Office, 203 University Hall.)

Wilford Stanton Miller, A.M., Secretary of the School of Education; *Secretary of the Summer Session.* (Office, 203 University Hall.)

William B. Castenholz, A.M., C.P.A., Comptroller.

Charles Maxwell McConn, A.M., Registrar. (Office, 156 Administration Building.)

CALENDAR

SUMMER SESSION, 1916

June 19, Monday	Registration Day
August 10 and 11, Thursday and Friday	Final Examinations

FIRST SEMESTER, 1916-17

September 11 to 15, Monday to Friday	Entrance Examinations
September 18 and 19, Monday and Tuesday	Registration Days
September 20, Wednesday, 8 a.m.	Instruction Begins

ANNUAL REGISTRATION OF STUDENTS

ALL DEPARTMENTS

'94-'95	810
'95-'96	855
'96-'97	1059
'97-'98	1582
'98-'99	1824
'99-'00	2225
'00-'01	2505
'01-'02	2932
'02-'03	3289
'03-'04	3592
'04-'05	3734
'05-'06	4091
'06-'07	4318
'07-'08	4746
'08-'09	4979
'09-'10	5118
'10-'11	5217
'11-'12	5209
'12-'13	5087
'13-'14	5539
'14-'15	5956
'15-'16	6427

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STAFF OF INSTRUCTION

SUMMER SESSION, 1916

Anderson, Frank Malloy Ph.D., Professor of History, Dartmouth College, Hanover, New Hampshire

Bagley, William Chandler, Ph.D., Professor of Education

Baldwin, Francis M., A.M., Assistant in Zoology

Bayley, Paul L., A.M., Assistant in Physics

Beach, Walter S., B.S.A., M.S., Assistant in Botany

Beal, George Denton, Ph.D., Associate in Chemistry

Berninger, Harriett Josephine, A.B., Assistant in Education

Bloomfield, Leonard, Ph.D., Assistant Professor of Comparative Philology and German.

Booth, Harry Tyler, B.S., Assistant in Physics

Boyer, Clarence Valentine, M.A., Ph.D., Associate in English

Brooks, Verna, A.B., Instructor in Physical Training for Women

Bull, Sleeter, M.S., Associate in Animal Nutrition

Burlison, William Leonida, M.S., Ph.D., Associate Professor of Crop Production

Canter, Howard Vernon, Ph.D., Assistant Professor of Classics and Assistant Dean, College of Liberal Arts and Sciences

Carnahan, David Hobart, A.M., Ph.D., Associate Professor of Romance Language

Carry, Charles S., Assistant in Romance Language

Chittendon, Edward Wilson, Ph.D., Instructor in Mathematics

Colby, Arthur Samuel, M.S., Assistant in Pomology

Cole, Arthur Charles, M.A., Ph.D., Associate in History

Crathorne, Arthur Robert, B.S., Ph.D., Associate in Mathematics

Derick, Clarence George, M.S., Ph.D., Assistant Professor of Chemistry

Duncan, James Merion, Assistant in Pattern Making.

Ekblaw, Karl John Theodore, M.S., Associate in Farm Mechanics

Engle, E.W., Instructor in Chemistry

Ensign, Newton Edward, B.A., B.S., Associate in Theoretical and Applied Mechanics

Erb, John Lawrence, F.A.G.O., Director School of Music and University Organist

Fargo, Roy Newton, B.S., Director Men's Gymnasium
Fazel, Charles Stever, A.M., Assistant in Physics.
Fleming, Georgia Elizabeth, B.S., Instructor in Textiles
Folsom, Juston Watson, Sc.D., Assistant Professor of Entomology
Frary, Hobart D., M.E., M.S., Assistant in Mathematics
Gill, Harry Lovering, Associate in Track Athletics
Gillet, Joseph Eugene, Ph.D., Associate in Comparative Literature and German
Glasgow, Robert Douglas, Ph.D., Instructor in Entomology
Glimstedt, Olaf H., G.D., Assistant in Athletic Training
Green, Alexander, A.M., Ph.D., Instructor in German
Griffin, Fred L., Art Metal and Jewelry
Gusler, Gilbert, B.S., Associate in Animal Husbandry
Hecker, Charles Henry, M.A., Ph.D., Ch.E., Instructor in Chemistry
Hillebrand, Harold Newcomb, M.A., Ph.D., Instructor in English
Hope, Leona, Instructor in Department of Household Science
Hopkins, B. Smith, Ph.D., Associate in Chemistry
Huff, George A., Director Department of Physical Training
Johnson, Laurence Crane, Ph.D., Research Assistant in Chemistry
Johnston, Charles Hughes, A.M., Ph.D., Professor of Secondary Education
Jones, Harry Stuart Vedder, A.M., Ph.D., Assistant Professor of English
Jones, Ralph R., Associate in Basketball
Kline, Earl Kilburn, M.A., Instructor in German
Knipp, Charles Tobias, A.M., Ph.D., Associate Professor of Experimental Electricity in Physics
Laguardia, Cincinnati, A.B., Assistant in Romance Language
Lake, Edward John, B.S., Assistant Professor of Art and Design and Acting Head of Department
Laprade, William T., Ph.D., Professor of History, Trinity College, Durham, North Carolina
Lewis, Howard Bishop, Ph.D., Associate in Physiological Chemistry
Lichtenberger, James P., A.M., Ph.D., Professor of Sociology, University of Pennsylvania, Philadelphia, Pennsylvania
Litman, Simon, Dr. Jur. Pub. et Rer. Cam., Assistant Professor of Economics
MacKinnon, Jean, A.B., A.M., Assistant Professor of Chemistry, Iowa State College, Ames, Iowa
Mathews, John M,, Ph.D., Assistant Professor of Political Science

Mauthe, O. C., Director of Physical Education, Stout Institute, Menominee, Wisconsin

Mez, John, Ph.D., Lecturer for the American Association for International Relations

Miller, Wilford Stanton, A.M., Assistant and Secretary in Education

Moore, Olin Harris, Ph.D., Associate in Romance Language

Nolan, Aretus Wilbur, A.B., M.S., Assistant Professor Agricultural Extension

Oldfather, William A., A.M., Ph.D., Professor of Classics

Park, Joseph C., Director of Industrial Education, Oswego, New York State Normal School

Paul, Harry Gilbert, A.M., Ph.D., Assistant Professor of English Language and Literature

Puckett, Hugh Wiley, M.A., Ph.D., Instructor in German

Rhoton, Alvis L., Professor of Pedagogy, Georgetown College, Georgetown, Kentucky

Roberts, Elmer, B.S., Instructor in Genetics and First Assistant in Experiment Station

Rowland, Floyd Elba, B.S., A.M., Assistant in Chemistry

Scovill, Hiram Thompson, A.B., Instructor in Accountancy

Sears, George Wallace, M.S., Ph.D., Instructor in Chemistry

Seely, Fred B., M.S., Associate in Theoretical and Applied Mechanics

Shelford, Victor E., Ph.D., Assistant Professor of Zoology

Stewart, Charles Leslie, A.M., Ph.D., Instructor in Economics

Stevens, Frank Lincoln, M.S., Ph.D., Professor of Plant Pathology

Sutcliffe, Emerson G., M.A., Assistant in English

Thompson, Charles Manfred, A.M., Ph.D., Associate in Economics

Tieje, Ralph Earle, M.A., Instructor in English

Townsend, Edgar Jerome, Ph.D., LL.D., Professor of Mathematics

Upham, Alfred Horatio, Professor of English, Miami University, Oxford, Ohio

Vallance, Alex, M.E., Instructor in Theoretical and Applied Mechanics

Wallace, Cora E., Supervisor of Music, Gary Indiana

Warner, Earl Horace, A.M., Assistant in Physics

Whipple, Guy Montrose, Ph.D., Professor of Education

Williams, Elmer Howard, Ph.D., Associate in Physics

Woolbert, Charles Henry, A.M., Associate in English and Public Speaking

Zuppke, Robert Carl, Ph.B., Associate in Football

GENERAL STATEMENT

The Summer Session of the University of Illinois for 1916 will open on June 19, and close on August 11, making a term of *eight weeks.* The opening day will be devoted to registration. The final examinations will be held on Thursday and Friday of the last week.

All of the courses, except those in physical training for men, will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Session a certificate for such attendance, but university credit will not be given for six-weeks' courses, except for those in physical training for men and in athletic coaching which will extend through only the first six weeks of the session.

The number of credit hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight credit hours or less.

Purpose

The primary purpose of the Summer Session is to meet the needs of teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. The greater number of courses offered are designed particularly for high-school teachers, supervising officers, and teachers of special subjects (art, music, manual training, domestic science, agriculture, etc.) and for college instructors, school supervisors, and principals who are working for advanced degrees. At the same time, students who may not fall within these groups are welcomed at the Session, and several courses of a more general nature are provided to meet their needs.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the college of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the university, including in the case of each college certain subjects especially prescribed for admission to that college.

The subjects prescribed for admission to the course in liberal arts are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; foreign language, 3 units, (two units must be in the same language); history, 1 unit. Five and one half elective units are required to make up the total of 15 units.

The subjects prescribed for admission to the *College of Liberal Arts and Sciences* for all curriculums leading to the degree of Bachelor of Arts (including the *general curriculum in liberal arts and sciences,* the curriculums in *journalism, household science,* and *medicine,* and the curriculum *preliminary to law*) are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units must be in the same language). Seven elective units are required to make up the total of 15 units.

For the curriculum in *general science* in the *College of Liberal Arts and Sciences* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

For the curriculum in *chemistry* in the *College of Liberal Arts and Sciences* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units; German or French, 2 units. Six elective units are required to make up the total of 15 units. The prescribed subjects for admission to the curriculum in *chemical engineering* are the same, except that the option between German and French is not given; German is required.

For the *College of Engineering* the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit; laboratory science, 1 unit. Eight elective units are required to make up the total of 15 units.

For the *College of Agriculture* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

For the *School of Music* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units must be in the same language); music, 2 units. Five elective units are required to make up the total of 15 units.

Students who can meet the prescriptions for any one of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

Admission to courses which give university credit, as *special students, not candidates for a degree,* may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

A student who has attended another college or university must present a letter of honorable dismissal from the institution previously attended.

Registration

Students will present themselves for registration on Monday, June 19. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first consult with Dean David Kinley of the Graduate School. (Dean Kinley's office is Room 109, Commerce Building.)

Fees

All fees are due upon registration, and should be paid at the Business office, Room 156, Administration Building.

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken.

Scholarships

By a ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the state who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must satisfy in full the entrance requirements for some one of the colleges as outlined on page 9.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class of 1916, and to persons (otherwise qualified) who have not been teachers the past year, but who are under contract to teach in the state during the coming year.

A person who wishes to take advantage of the scholarship privilege should present to the Director of the Session prior to June 1, 1916, a statement from the board of education employing him to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1916) may present either his diploma or a written statement from the President of the normal school certifying that the course has been completed.

Application blanks for scholarships may be obtained by addressing the Director.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted towards the degrees of Bachelor of Arts and Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part or even in full by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should see the general University catalog (the "Annual Register") under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the Dean or Assistant Dean of the college of his choice—

For the College of Liberal Arts and Sciences—Assistant Dean Canter, Room 304, University Hall.

For the College of Commerce and Business Administration—Acting Dean Weston, Room 104, Commerce Building.

For the College of Engineering—Assistant Dean Miller, Room 300, Engineering Building.

For the College of Agriculture—Assistant Professor Rankin, Room 100, Agricultural Building.

General Assembly

On the first Thursday of the Session, at 4 p. m., an Assembly will be held in the Chapel of University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc., and the opportunities and advantages of summer work at the University will be explained.

Lectures, Receptions and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which are in themselves of no little value, and which give to the Summer Session an atmosphere differing but little from that of the other sessions of the year. Prominent among these incidental exercises are the receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

Through the courtesy of the Carnegie Endowment for International Peace, Dr. John Mez will deliver a series of lectures on International Relations, extending through the entire eight weeks of the Summer Session.

The song services, that proved so successful during the last Session, will be continued, under the direction of Director J. L. Erb of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps each Wednesday evening, 6:45 (except first and last week).

Director Erb will give a series of six organ recitals during the summer.

Arrrangements have been made with the Coburn Players for a series of open-air performances.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the certificating law enacted by the General Assembly, in 1913, appear the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate.
   Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate.
   Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate.
   Requirements same as for elementary school certificate, except that the examination includes, in addition, sociology, history of education, school organization administration and supervision.

County Certificates

1. Third-grade elementary-school certificate.
   Examination in common branches.
2. Second-grade elementary-school certificate.
   Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate.
   Examination in the common branches, three of the natural sciences, English, algebra, general history and pedagogy.
4. High-school certificate.
   Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate.
   Examination in English, educational psychology, history of education, and administration.
6. Kindergarten-primary certificate.
7. Special certificate.
   Examination in English and principles and methods of teaching.
8. Provisional certificate.
9. Emergency certificate.

Examinations for the *State Elementary School Certificate*, the *State Supervisory Certificate* and the *State High School Certificate* will be held at the University in July; *provided that at least fifteen applicants notify the State Superintendent prior to June* 10, 1916, *of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university, either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected.

"The thesis must be filed with the Superintendent of Public Instruction before July 15, 1916."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session Courses are especially adapted to prepare for the professional examinations:

Education S-1a, S-1b and S-10; Principles and Methods of Teaching.

Education S-4, S-20 and S-21 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S-2; History of Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-1a, should prepare for the examination in educational psychology.)

Education S-6; The Principles of High School Education.

Education S-104; Seminary in Educational Administration.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Manual Training

The work in manual training will be under the direction of Director Joseph C. Park, of the Department of Industrial Education, State Normal School, Oswego, New York. The work will include courses in wood-working and art metal work.

The demand for well-qualified teachers of manual training is becoming more and more insistent each year, and the University is not now able to supply even a small fraction of the teachers of manual training that are called for by the schools of the State. The Summer work is particularly important since it is planned especially to meet the needs of teachers of manual training in the elementary and high schools.

Agriculture

The demand for teachers of agriculture in the high schools has led to an extension of the summer offerings in this subject. The courses in secondary-school agriculture are planned primarily to meet the needs of teachers of agriculture in the high schools. The courses will include a study of general agriculture adapted to secondary schools, with emphasis placed on the subject-matter of agriculture, and such reference to the methods of presentation as the needs of the class demand.

Household Science

The Household Science Department has again made special provision for work in Applied Art in the Summer Session. Miss Leona Hope, formerly of the University of Wisconsin, has charge of the work in Costume Design, Home Decoration and Weaving. Miss Hope has had excellent training in both pure and applied art and a wide experience in teaching them. Miss Fleming has had excellent training and successful experience in teaching the application of art to dress.

Graduate Work in the Summer Session

During the past two years the Summer Session has placed increasing emphasis upon graduate courses leading to the Master's degree. The various departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid upon graduate courses in English, chemistry, economics, and education.

The normal requirement for the Master's degree is satisfactory work continued during one year of residence. This means a residence

of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student by working at the University for one week after each Session under the direction of the professor in charge of his major subject, may earn the Master's degree in four summers.

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory". Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition, to count the work toward the Master's degree.

Summer Courses in Library Training

Beginning Monday, June 19, 1916, and continuing for six weeks, the Library School will conduct a Summer Session *to which will be admitted only high-school graduates actually employed as librarians, or library assistants, or teacher-librarians, or under definite appointment to serve in such positions.* The curriculum will be planned to meet especially the needs of workers in public libraries and in high-school libraries of Illinois and no tuition fee will be charged students entering from this state; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No university credit is given for the work.

The work will occupy the whole time of the student. The number of lectures in each subject will be approximately as follows: Cataloging, 20; classification and book numbers, 13; book selection, 14; administration of small libraries, 10; reference work, 10; work

with the children, 10; loan system, order, accession and shelf work binding and repair, 13.

For furthur information address the Director of the University of Illinois Library School, Urbana, Illinois.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Training for men. These courses were offered to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. It was designed to assist both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation.

In the 1915 Session the class registrations were 669 as against 254 in 1914. Certificates were issued to students who satisfied the instructors that they had acquired sufficient groundwork to be able to go out and take charge of coaching work. The athletic plant of the University was turned into a laboratory and the larger part of the instruction was given on Illinois Field.

Accordingly the courses will again be a feature of the Summer Session, occupying the first six-weeks. It will be eminently practical, all the courses being taught by the men who are successfully coaching the athletic teams of the University of Illinois today. Courses will be offered in baseball (Director Huff), track athletics (Mr. Harry Gill), basketball (Mr. Ralph Jones), and football (Mr. Robert Zuppke).

Mr. Mauthe, of Stout Institute, and Mr. Fargo, Director of the Gymnasium, University of Illinois, will offer a large variety of courses in gymnastics.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Ill.

Explanation of Abbreviations, Etc.

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of

the same number offered during the regular university year. Summer courses do not always cover the same ground as those similarly numbered in the regular session. Students wishing to know in what respect such courses are similar will be gladly furnished with the desired information upon application to the Director.

The number of credit hours that may be earned in any course is clearly indicated in every case.

Courses numbered 100 and above carry graduate credit and are open only to graduate students.

The following abbreviations are used to designate the different buildings in which classes are held:

Adm. B.....Administration Building
Ag.....College of Agriculture
C.....Chemical Laboratory
Com. B.....Commerce Building
E.H.....Engineering Hall
F.M.....Farm Mechanics Building
L.A.M.....Laboratory of Applied Mechanics
L.B.....Law Building
L.H.....Lincoln Hall
P.L.....Physics Laboratory
N.H.....Natural History Building
Stk.Pavil .....Stock Judging Pavillion
T.B.....Transportation Building
U.H.....University Hall
V.B.....Vivarium Building
W.H.....Woman's Building

OUTLINE OF COURSES

ACCOUNTANCY

(See Business Organization and Operation)

AGRICULTURE

Associate Professor BURLISON, Assistant Professor NOLAN, Messrs. COLBY, BULL, GUSLER, ROBERTS, EKBLAW, and GREENE, Mr. NOLAN in charge.

The work in the Summer Session is planned to meet the needs of teachers of Agriculture in elementary and high schools, and also to enable those seeking degrees in Agriculture to cover a large portion of the required freshman and sophomore subjects. The courses will be accepted as freshman and sophomore prerequisites for advanced work as far as they go. The numbers used indicate, the regular semester courses most nearly corresponding. Agricultural courses of the same number cannot be taken for credit in both regular and summer sessions.

Credits in agriculture may be counted for graduation in the College of Agriculture and in certain cases in the College of Liberal Arts and Sciences; students who wish to offer work in this subject for graduation in the latter College should consult the Assistant Dean of that College.

S 1. GENERAL AGRICULTURE.—A general study of a few of the larger topics of Agronomy, Animal Husbandry, Horticulture and Farm Business. Selection of subject-matter, and methods of presentation for elementary and secondary schools. The use of home projects and club work in school agriculture. Lectures, class discussions, and field work. M.T.W.T.F., 10; 553 Ag.; 2½ credit hours.

Assistant Professor NOLAN, Mr. GREENE.

S 1a. (Hort.) ELEMENTS OF HORTICULTURE.—With special reference to the farm home. Principles of orcharding; the home orchard and small fruit garden from planting to bearing; orchard insects and diseases with methods of control. Lectures, recitations, and practical exercises. M. T.W. T., 1, 2; 302 Ag.; 2 credit hours.

Mr. COLBY.

S 1b. (Hort.) ELEMENTS OF HORTICULTURE.—With special reference to the farm home. Principles of vegetable gardening; the laying out and planting of a garden and its subsequent care; storage of vegetables and fruit for winter; essentials of ornamental planting for the farm home. Lectures, recitations, and practical exercises. T. W. T. F., 3, 4; 302 Ag.; 2 credit hours.

Mr. COLBY.

S 5. (An. Hus.) FUNDAMENTALS OF LIVE STOCK JUDGING.—The names and location of external parts of the various kinds of live stock; the use of the score-card; comparative judging; breed identification; and types of farm animals. Lectures and practical work. M.T.W., 8; T.F., 8, 9; Stk. Pavil.; 2½ credit hours. Mr. GUSLER.

S 8. (An. Hus.) PRINCIPLES OF BREEDING.—Elemental facts of evolution and genetics; origin of domesticated animals and plants; history of systematic breeding; the relation to genetics of old and new theories of breeding. M.W., 11; 702 Ag.; 1 credit hour.

Mr. ROBERTS.

S 20. (Agron.) FARM CONCRETE CONSTRUCTION.—Materials used in concrete construction; their selection, preparation, storage; mixing and placing concrete; simple comparative tests; specifications and cost estimates for farm concrete construction. Lectures, recitations, and laboratory. M.T.W.T., 1, 2; 205 F.M.; 2 credit hours.

Mr. EKBLAW.

S 21. (An. Hus.) PRINCIPLES OF FEEDING. — Classification, digestibility, and functions of feed nutrients; classification and values of feeding stuffs; feed requirements and calculation of balanced rations for farm animals. *Prerequisites:* Chemistry 1, 2, and 3, and Animal Husbandry 5. M.T.W.T.F., 10; 702 Ag.; 2 credit hours.

Mr. BULL.

S 25. (Agron.) FARM CROPS.—Plant growth; structure; habits and requirements; preparation of seed bed; seed selection; grading and farming of grain; storing grain; market grades of grain and grain judging; examination for purity; testing for vitality; weeds, identification, distribution, eradication, control; diseases of farm crops and methods of prevention. Lectures, laboratory, and field work. M.T.W.T., 10, 11; 600 Ag.; 2 credit hours.

Associate Professor BURLISON.

S 26. (Agron.) FARM MECHANICS and EQUIPMENT.—Elements of agricultural mechanics, useful farm practice, farm and home equipment; rope tying and splicing, soldering, babbitting, pipe

cutting and fitting, belt lacing and splicing; principles of draft in farm machines; farm water supply and sanitation; heating and ventilating; power transmission; farm power plant. M.T.W.T.F., 3, 4; 205 F.M.; 2½ credit hours. Mr. EKBLAW.

S 90. RURAL EDUCATION.—A study of rural life conditions, needs, and agencies at work in rural progress. Agricultural education, the rural high school, the one-room country school, farmers' clubs, the country church, and other agencies as factors in rural education. Lectures, readings, reports, and class discussions. T.W.T.F., 11; 553 Ag.; 2 credit hours. Assistant Professor NOLAN.

ART AND DESIGN

Professor LAKE

S 1. ELEMENTARY. — Form drawing from still-life, cast, and nature; principles of outline and shading in pencil, charcoal, and crayon; lectures on the principles of perspective. M.T.W.T.F., 1, 2; 405 U.H.; 2 credit hours. Professor LAKE.

S 12. DESIGN.—Theory and practice; the theory of pure design and the effect of material upon execution; the fitness of different forms of media for different sorts of design; space division and space relations; the theory of color; color schemes and exercises; conventionalization of natural forms for various functions; practice in execution. M.T.W.T.F., 3; 407 U.H.; 2 credit hours.

Professor LAKE.

S 20. HISTORY OF THE FINE ARTS.—The periods and styles of architecture, sculpture and painting during the Italian Renaissance and up to the present time. M.T.W.T., 4; 410 U.H.; 2 credit hours.

Professor LAKE.

BOTANY

Professor STEVENS, Mr. BEACH.

S 7a. PLANT PATHOLOGY. — Causal agents, symptoms morbid histology, diagnosis and treatment, and methods of study. Subject matter and method selected with especial attention to the needs of teachers of agriculture. Lecture-quiz, Th. F., 3; Laboratory, W. Th. F. S., 8-12; Botany Annex; 5 credit hours.

Professor STEVENS, Mr. BEACH.

Prerequisite: Entrance credit in Botany, or Botany 1.

S 4. THE LOCAL FLORA.—Morphology, identification, and classification of wild plants. A laboratory and field course for students

desiring personal acquaintance with the plants of Illinois, and especially for those qualifying as teachers in the public schools. Laboratory, lecture and quiz, M.T.W.F., 8-10; S., 8-12; 216; N. H.; 3 credit hours. Professor STEVENS, Mr. BEACH.

Prerequisite: Entrance Botany or its equivalent.

COURSE FOR UNDERGRADUATES AND GRADUATES

S 16a. TAXONOMY and ECOLOGY of FUNGI.— Advanced practice on selected groups of fungi or groups of host plants. For graduates or advanced undergraduates. Arrange time; 203 Botany Annex; 3 or 5 credit hours. Professor STEVENS.

Prerequisite: 10 hours of botany including 4c or 7a or equivalent.

COURSES FOR GRADUATES ONLY

S 104. MYCOLOGY.—Individual assignments of subjects and problems in field and laboratory. Arrange time; 203 Botany Annex; 3 or 5 credit hours. Professor STEVENS.

S 106. PLANT PATHOLOGY.—Diseases of plants and disease agents. Special subjects are assigned upon consultation. Arrange time; 203 Botany Annex; 3 or 5 credit hours.

Professor STEVENS.

BUSINESS ORGANIZATION AND OPERATION

(See also Economics)

MR. SCOVILL

A. *ACCOUNTANCY*

S 15. PRINCIPLES OF ACCOUNTING.—This course is not accepted in partial fulfillment of the requirement of Accountancy 1 in any University course. It is intended for those who wish to study the subject with a view to practice or high-school teaching. M.T.W.T.F. 10; 204 Com. B.; 2 credit hours. Mr. SCOVILL.

Prerequisite: Elementary bookkeeeping.

B. *BUSINESS LAW*

S 1. ELEMENTARY COMMERCIAL LAW.—The underlying principles of the law of contracts, agency, partnerships and other forms of business organization. The course is not accepted for credit for

students in the College of Commerce and Business Administration. M.T.W.T.F., 11; 206 Com. B.; 2 credit hours. Mr. Scovill.

CHEMISTRY

Assistant Professor Derick, Dr. Beal, Dr. Hopkins, Dr. Lewis, Dr. Sears, Dr. Hecker, Dr. Johnson, Dr. Engle, Mr. Rowland.

Note: All of the courses in chemistry offered in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

S 1. Elementary Chemistry.—A course in general inorganic chemistry, dealing for the most part with the chemistry of the non-metallic elements; the course consists of illustrated lectures, recitations, and laboratory work. Text: Noyes' *Text Book of Chemistry*, (Henry Holt and Company). Lecture—quiz, M.T.W.T.F.S., 11; Laboratory, M.T.W.T.F.S., 8, 9 or 9, 10; 5 credit hours.

Dr. Hopkins, Dr. Engle, Mr. Rowland.

S 1a. Inorganic Chemistry.—For students who have had one year of high-school chemistry. This course may be taken at the same hours as chemistry S 1, but only four hours of laboratory work are required. Chemistry Building; 3 credit hours.

Dr. Hopkins, Dr. Engle.

S 1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S 1, but only six hours of laboratory work are required. Chemistry Building; 4 credit hours. Dr. Hopkins, Dr. Engle.

S 2a. Inorganic Chemistry and Qualitative Analysis.—The general chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Text Book of Chemistry*, Noyes and Smith's *Qualitative Analysis;* (Henry Holt and Company). Lectures, M.T.W.T., 9; Quiz, M.T.W.T., 8; Laboratory, M.T.W.T.F.S., 10, 11; Chemistry Building; 5 credit hours.

Dr. Hecker, Mr. Rowland.

Prerequisite: Chemistry 1 or 1a.

S 3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes' *Text Book of Chemistry*, Noyes and Smith's *Qualitative Analysis.* (Henry Holt and Company.) Arrange. Chemistry Building; 6 credit hours. Dr. Hecker

Prerequisite: Chemistry 1.

S 17. Teachers' Course.—A study of the methods which may be followed in teaching *elementary chemistry,* and a review of the fundamental principles of the science. T.T., 10; Chemistry Building; 1 credit hour. Dr. Hopkins.

Prerequisite: One year's work in chemistry.

S 5a. Elementary Quantitative Analysis. — The laboratory work comprises a series of experiments which illustrate the fundamental principles of gravimetric and volumetric methods; the lectures and recitations consist of a consideration of stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis,* (The Macmillan Company). Lecture, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12. F., 8-12. Chemistry Building; 5 credit hours.

Dr. Beal, Dr. Sears.

Prerequisite: Chemistry 1 and 3.

S 13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5 a. Talbot's *Quantitative Chemical Analysis,* (The Macmillan Company). (For students in Agriculture.) Lecture or Quiz, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12, F., 8-12; Chemistry Building; 5 credit hours.

Dr. Beal, Dr. Sears.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 5c. Food Analysis.—Quantitative organic analysis, with special reference to the examination of food and drug products: alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis* and Sherman's *Food Products,* (The Macmillan Company). *"Bulletin 107, rev., U. S. Bureau of Chemistry."* Lecture, M.T.W.T. F., 11; Laboratory, M.T.W.T.F., 8-11; Chemistry Building; 5 credit hours. Dr. Beal, Dr. Sears.

S 9a. Organic Synthesis.—This course consists of the preparation of the typical compounds discussed in S 14. Text: Noyes' *Organic Chemistry for the Laboratory,* (Chemical Publishing Company). M.T.W.T.F., 9–12; Chemistry Building; 2 credit hours.

Assistant Professor Derick, Dr. Johnson.

Prerequisite: Registration in S 14 (First Semester).

S 9b. Organic Synthesis.—Continuation of S 9a. Text: Noyes' *Organic Chemistry for the Laboratory.* M.T.W.T.F., 9, 10, 11; Chemistry Building; 2 credit hours.

Assistant Professor Derick, Dr. Johnson.

Prerequisite: S 9a and registration in S 14 (Second Semester).

S 14. Organic Chemistry (First Semester).—A discussion of the characteristics of the more typical and simple organic compounds, followed by a brief consideration of most of the important classes of derivatives of carbon. This course may be substituted for Chemistry 9 of the academic year. M.T.W.T.F.S., 8; Chemistry Building; 3 credit hours. Assistant Professor Derick, Dr. Johnson.

Prerequisite: Chemistry 2 and 3.

S 14. Organic Chemistry (Second Semester).—Lectures and recitations. Noyes' *Organic Chemistry,* (Henry Holt and Company). Daily, arrange; Chemistry Building; 3 credit hours.

Assistant Professor Derick.

Prerequisite: Chemistry S 14 (First Semester) or equivalent.

S 11 and S 111.—Research.—Opportunity will be given for advanced work and research in inorganic, organic, analytical, or physiological chemistry. Arrange.

Assistant Professor Derick, Dr. Beal and Dr. Lewis.

(Subject to approval of Graduate School Faculty.)

S 15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile putrefaction products; feces; blood, milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroughly for the prospective student of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews' *Physiological Chemistry* (Wm. Wood & Co.); Hawk's *Practical Physiological Chemistry.* Arrange; Chemistry Building; 5 credit hours. Dr. Lewis.

S 92. History of Chemistry.—Periods, theories, leaders; use of literature. Lectures, reports, reference work. Two periods a week; 1 credit hour. Assistant Professor Derick.

CLASSICAL DEPARTMENT

LATIN

Professor OLDFATHER, Assistant Professor CANTER

S 1. PLAUTUS.—Three plays will be read with brief discussion of the language and verse of comedy. For those who have had three or four years of high-school Latin. M.T.W.T.F., 2; 114 L.H.; 2½ credit hours. Assistant Professor CANTER.

S 2. CATULLUS and HORACE.—Selections from the lyric poetry of these authors. T.W.T.F., 1; 114 L.H.; 2 credit hours.

Professor OLDFATHER.

S 3. ROMAN HISTORY.—Lectures and readings. One hour per week will be devoted to a consideration of selected aspects of the private life of the Romans. The lectures will be supplemented by stereopticon views and visits to the museum of classical art and archaeology. T.W.T.F., 11; 120 L.H.; 2 credit hours.

Professor OLDFATHER.

S 4. TEACHERS' COURSE.—Special attention to the problems and methods of instruction in Latin in the secondary schools; the essentials of Latin study in the first, second, and third years; books and equipment. The slides and photographs of the classical department and the museum of classical art and archaeology will be at the disposal of the class. T.T., 120 L.H.; 1 credit hour.

Assistant Professor CANTER.

COURSE FOR GRADUATES ONLY

S 115. ROMAN ELEGY.—The origin and development of elegy as a department of literature on Greek and Roman soil; elegy in its relation to other lyric forms; lectures and reports; translations from Catullus, Tibullus and Propertius, three times a week, arrange; 124 L.H.; 1 unit. Assistant Professor CANTER.

(Subject to approval of Graduate School Faculty.)

COMMERCIAL LAW

(See Business Organization and Operation)

ECONOMICS

(See also Business Organization and Operation)

Assistant Professor LITMAN, Dr. C. M. THOMPSON, Dr. STEWART.

S 2. PRINCIPLES OF ECONOMICS.—M.T.W.T.F.S., 8; 101 Com. B.; 3 credit hours. Dr. C. M. THOMPSON.

Prerequisite: One year of university work or the permission of the instructor.

S 3. MONEY AND BANKING.—M.T.W.T.F., 9; 307 Com. B.; 2½ credit hours. Dr. STEWART.

Prerequisite: A course in the principles of economics and the permission of the instructor.

S 16c. AGRICULTURAL ECONOMICS. — The economic principles underlying the farming industry and the conditions of rural life. M.T.W.T.F., 10; 307 Com. B.; 2½ credit hours. Dr. STEWART.

Prerequisite: Economics 1 or 2; or the permission of the instructor.

S 26. ECONOMIC RESOURCES.—Extractive, cultivating and manufacturing industries of different countries, with special reference to the resources and the economic activities of the United States. M.T.W.T.F., 9; 204 Com. B.; 2½ credit hours.

Assistant Professor LITMAN.

COURSE FOR UNDERGRADUATES AND GRADUATES

S 19. ECONOMIC PHASES OF UNITED STATES HISTORY, 1820-1860. —Population, the public domain, the westward movement, transportation and communication, foreign commerce and the carrying trade, agriculture, manufacturing, labor, currency and banking, the tariff. M.T.W.T., 9; 101 Com. B.; 2 credit hours; ½ graduate unit.

Dr. C. M. THOMPSON.

Prerequisite: At least 8 hours of economics, including the principles. Teachers of experience may be admitted at the discretion of the instructor.

COURSE FOR GRADUATES ONLY

S 104. THEORY AND POLICIES OF INTERNATIONAL TRADE.—Significance of foreign commerce; commercial policies and their effects; growth of international competition; methods used for the purpose of trade expansion; analysis of the export and import trade of the United States. M.T.W.T.F., 8; 204 Com. B.; 1 graduate unit.

Assistant Professor LITMAN.

EDUCATION AND PSYCHOLOGY

Professors BAGLEY and JOHNSTON; Professors WHIPPLE and RHOTON; Mr. MILLER, Miss BERNINGER.

Note: The prerequisites as stated in connection with the following courses may, in the discretion of the head of the department and the instructor in charge of each course, be modified in their application to teachers who may desire to enroll in the courses in question.

COURSES FOR UNDERGRADUATES

S 1a. PRINCIPLES OF EDUCATION.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; the problem of educational values. M.T.W.T.F.S., 8; 206 U.H.; 3 credit hours. Mr. MILLER.

Prerequisite: Junior standing.

Equivalent: With Education S 1b, this course is equivalent to Education 1 as offered during the university year. Education 1 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S 1b. THE EDUCATIONAL SYSTEM.—A brief survey of the school system of the United States, its present organization, its origin, its distinctive characteristics as compared with other systems, and the more important of its present problems. Lectures and readings. M.T., 2; 206 U.H.; 1 credit hour. Professor BAGLEY.

Prerequisite: Junior standing.

Equivalent: With Education S 1a, this course is equivalent to Education 1.

S 2. HISTORY OF MODERN EDUCATION.—The development of educational theory and practice from the Renaissance. Text: Monroe's *History of Education: Brief Course.* M.T.W.T.F., 1; 113 L.H.; 2½ credit hours. Professor RHOTON.

Prerequisite: Junior standing.

Equivalent: Education 2 (in part).

S 10. THE TECHNIQUE OF TEACHING.—Types of classroom exercises and the preparation of teaching plans; the hygiene of instruction; classroom management; professional ethics. (Required, by Senate ruling, of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools). M.T.W.T.F.S., 8; 211 U.H.; 3 credit hours.

Miss BERNINGER.

S 25. Educational Psychology. — A systematic study of mental activity with special reference to educational problems. The course deals with mental heredity, instinct, habit and learning, attention and interest, association, the training of observation, memory, reasoning, and the like. Texts: Whipple's *Questions in Psychology,* and Colvin and Bagley's *Human Behavior.* T.W.T.F., 9; 417 U.H.; 2 credit hours. Professor Whipple.

Prerequisite: Junior standing.

Equivalent: Education 25 (in part).

COURSES FOR GRADUATES AND UNDERGRADUATES

S 4. School Organization and Administration.—The establishment of schools and provisions for their administration; units of control; maintenance; training and selection of teachers. T.W.T.F., 3; 202 L.H.; 2 credit hours. Mr. ————

Prerequisite: Education 1 or equivalent.

Equivalent: Education 4 (in part).

S 6. The Principles of High-School Education.—A study of the evolution of high schools and of the fundamental conceptions of secondary education; the relationships of the high school to the state system; its legal status; its articulation with the elementary school, with the college, with the technical schools, with the community and with the home. Typical problems to be considered are the teaching staff, reorganization of curriculums, "controls" of construction, direction of student activities and the administration of vocational and moral guidance, school journalism, debating activities, athletics, high-school hygiene, etc. M.T.W.T., 10; 202 L.H.; 2 credit hours. Professor Johnston.

Prerequisite: Education 1, or equivalent.

Equivalent: Education 6 (in part).

S 18. Method in Educational Research.—A study of statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees). W.T.F., 2; 113 L.H.; 1½ credit hours. Mr. ————

Prerequisite: Education 1.

Equivalent: Education 18.

S 20. Supervision.—A course for principals, superintendents, supervisors. The limitations, types, functions, standards and devices of supervisors; the subject limits and time limits of the course of study; the adaptation of the materials of the course of study to the

various types of mind represented in the student population; the rating of teachers; improvement of teachers in service; the technique of criticism. Lectures, readings and investigations of special problems. M.T.W.T., 8; 207 U.H.; 2 credit hours. Mr. ————

Prerequisite: Education 1 or equivalent.

Equivalent: Education 20 (in part).

S 21. UNITS, SCALES, AND STANDARDS.—A course for school superintendents. An intensive study of units, scales, and standards for measuring educational achievement or determining progress in arithmetic, spelling, handwriting, reading, composition, drawing, history, and geography; emphasis to be placed upon the use of these units, scales, and standards as supervisory devices. Lectures, readings, and the investigation of some special problem in educational measurement. M.W., 9; 206 U.H.; 2 credit hours. Mr. MILLER.

Prerequisite: Education 1 or equivalent.

S 30. CONTEMPORARY EDUCATIONAL THEORY.—A critical study of recent writings in educational theory, and an analysis of the theory underlying contemporary educational movements,—the Gary system, the junior-high-school movement, prevocational education, etc. M.T., 1; 206 U.H.; 1 credit hour. Professor BAGLEY.

S 43. MENTAL TESTS.—Laboratory drill in the technique of mental tests, including tests of sensory capacities; attention; memory; learning; suggestibility; inventiveness; and the like; and systems of tests for diagnosis of mental age; general intellectual status; mental retardation; etc. Text: Whipple's *Manual of Mental and Physical Tests.* T.T., 10–12; 417U.H.; 1 credit hour.

Professor WHIPPLE.

Prerequisite: Education 25 or equivalent and the consent of the instructor.

COURSES FOR GRADUATES ONLY

S 106. SEMINAR IN SECONDARY EDUCATION.—A course for graduate students in the organization, supervision and management of high schools. A comparison of standards and functions of different national systems of secondary education, of educational principles of curriculum organization, of methods of instruction in special subjects, and of status of secondary teachers; types of American secondary schools, standardizing influences and agencies, high school "surveys"; extra-classroom activities of modern high schools; curriculum differentiation in junior and senior high schools; vocational "courses" and "curriculums" suitable for different types and sizes of high

schools; interpretation and summary of experimental studies in the field of secondary education. Lectures, intensive readings and individual investigations and reports of special problems. Tu., 4–6 and arrange (weekly individual conferences with instructor). 103 L.H.; 1 graduate unit. Professor JOHNSTON.

Prerequisite: Graduate standing, with preliminary courses in Education satisfactory to the instructor.

S 104. SEMINAR IN SCHOOL ADMINISTRATION.—M., 4–6; 103 L.H.; ½ graduate unit. Mr. ————

Prerequisite: Graduate standing, with preliminary courses satisfactory to the instructor.

S 125. SEMINAR IN EDUCATIONAL PSYCHOLOGY.—Th., 4–6; 103 L.H.; ½ graduate unit. Professor WHIPPLE.

Prerequisite: Graduate standing, with preliminary courses satisfactory to the instructor.

S 110. SEMINAR IN METHODS OF TEACHING.—The problem of the study of method; the literature of methods of teaching; types of school exercises,—intensive study of reports of classroom teaching and an attempt at a classification of types. W., 4–6; 103 L.H.; ½ graduate unit. (Subject to approval of the Executive Faculty of the Graduate School.) Professor BAGLEY.

Prerequisite: Graduate standing, with preliminary courses satisfactory to the instructor.

ENGLISH

Professor UPHAM; Assistant Professor PAUL and JONES; Dr. BOYER, Dr. HILLEBRAND

S 1a. SURVEY OF ENGLISH LITERATURE.—Chaucer and his contemporaries, the popular ballads, Malory, the Renaissance, the Reformation, Elizabethan Prose, Spenser, the Elizabethan lyric, Shakespeare, Bacon, Cavalier lyrics, religious lyrics, Milton. Text: *Century Readings in English Literature* (Part I). M.T.T.F., 9; 307 U.H.; 2 credit hours. Dr. HILLEBRAND.

Prerequisite: One year of college work or the equivalent.

Equivalent: First half of English 1. (Together with S 1b this course covers the work of English 1. To be credited as equivalent to English 1, S 1a and S 1b should be taken simultaneously.)

S 1b. SURVEY OF ENGLISH LITERATURE.—Bunyan and the prose of the Puritans, the Restoration, Dryden, Swift, the periodical essayists, Pope and the pseudo-classical school, De Foe and the novelists,

Thomson, Gray, Samuel Johnson, Goldsmith, Cowper, Burns. Text: *Century Readings in English Literature* (Part I). M.T.T.F., 11; 307 U.H.; 2 credit hours. Dr. BOYER.

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 1. (To be credited as equivalent to English 1, S 1b and S 1a should be taken simultaneously.)

S 12. AMERICAN LITERATURE.—Bryant, Irving, Cooper, Hawthorne, Emerson, Poe, Longfellow, Whittier, Lowell. Lectures, discussions, readings, and reports. Text: Page's *Chief American Poets.* T.W.T.F., 1; 202 L.H.; 2 credit hours. Assistant Professor PAUL.

Prerequisite: One year of college English or the equivalent.

Equivalent: English 12.

S 23. SHAKESPEARE.—Detailed study of Othello, Twelfth Night, and Henry V, with brief consideration of several other representative plays. M.T.W.T.F., 10; 315 U.H.; 2½ credit hours.

Professor UPHAM.

Prerequisite: One year of college English or the equivalent.

Equivalent: English 23 (in part).

S 33. ENGLISH LITERATURE from 1789 to 1837.—Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, and Landor; Edgeworth, Austen, Lamb, Hazlitt. M.T.W.T.F.S., 9; 302 U.H.; 3 credit hours.

Dr. BOYER.

Prerequisite: Eleven hours of English literature, or eight hours of English literature and eight of a foreign language.

Equivalent: English 33.

S 41. ENGLISH FOR TEACHERS.—Outlining courses in English; a study of the classics used in high schools; the correcting and grading of student compositions; library equipment; problems in the teaching of English. Lectures, discussions, and reports. M.T.W.T., 2; 202 L.H.; 2 credit hours. Assistant Professor PAUL.

Prerequisite: Sixteen hours of English literature. Open to any upperclassman with the consent of the instructor. (Not credited toward advanced degrees, or toward a major in English.)

Equivalent: English 41.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 39. SPENSER.—The culture of the English Renaissance as illustrated by Spenser's poems; particular attention is directed to the philosophical, political, and religious thought of the time. M.T.W.F.,

1; 218 L.H.; 3 credit hours, ¾ unit. Assistant Professor JONES.

Prerequisite: Sixteen hours of English literature. Open to any upperclassman or graduate student with the consent of the instructor.

S 45. CONTEMPORARY EUROPEAN DRAMA. — The "theatre of ideas", Teutonic naturalism, and the peasant drama of England and Ireland. Modern stagecraft. Investigation of the work of Ibsen, Strindberg, Hauptmann, Schnitzler, Hofmannstahl, Zola, Becque, Brieux, Hervieu, Maeterlinck, Shaw, Galsworthy, Masefield, Barker, Synge, Fitch, Moody, and others. M.T.W.T.F.S., 11; 110 L.H.; 3 credit hours, ¾ unit. (Attention of those who register in this course is called to Public Speaking S 10). Dr. HILLEBRAND.

Prerequisite: Sixteen hours of English literature. Open to any upperclassman or graduate student with the consent of the instructor.

Equivalent: English 45.

COURSES FOR GRADUATES ONLY

S 135. PROBLEMS IN AMERICAN LITERATURE.—An examination of some of the more important American prose and verse with reference to European sources and influences. M. Th., 3; ½ unit.
Assistant Professor PAUL.

Prerequisite: Graduate standing.

Equivalent: Part of English 135.

S 136. THE RISE OF NEO-CLASSICISM.—The literary relations of France and England at the end of the seventeenth century. Lectures, readings, theses. M.T.W.T.F., 9; 218 L.H.; one unit.

Prerequisite: Graduate standing.

Equivalent: First semester of English 136.

RHETORIC

Assistant Professor JONES; Mr. TIEJE, Mr. SUTCLIFFE

S 1. RHETORIC AND THEMES.—Review of the principles of structure; grammar; punctuation; the sentence; the reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: *Handbook of Composition* and Scott and Denney's *Paragraph Writing*. M.T.W.T.F.S., 10; 308 U.H.; 3 credit hours. Mr. TIEJE.

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S 2. Rhetoric and Themes.—Argumentation, narration, and description. Four short themes a week, with one or two long briefs and long arguments. Oral and written exercises. Text: Scott and Denney's *Paragraph Writing*. M.T.W.T.F.S., 11; 308 U.H.; 3 credit hours. Mr. Sutcliffe.

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

S 3. English Composition.—Intended to afford to students who have had an elementary college course in composition an opportunity for further practice and criticism. An attempt will be made to accommodate the work to the tastes and needs of members of the class. M.T.W.T.F.S., 2; 218 L.H.; 3 credit hours.

Assistant Professor Jones.

Prerequisite: Rhetoric 1–2 or equivalent.

Equivalent: Rhetoric 3.

PUBLIC SPEAKING

Mr. Woolbert

S 1. Oral Expression.—Study of vocal methods and the relation of the voice to the interpretation of thought. M.T.T.F., 8; 318 U.H.; 2 credit hours. Mr. Woolbert.

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(This course does not yield credit until supplemented by Public Speaking 2, 10, or their equivalents.)

S 10. Interpretation and Dramatization.—Oral reading of various types of literature; the principles of stage action; staging and acting of several one-act plays. (Attention of those who register in this course is called to English S 45.) M.T.T.F., 9; 318 U.H.; 2 credit hours. Mr. Woolbert.

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S 11. Problems in the Teaching of Oral English.—Primarily for high-school teachers. M.W., 10; 318 U.H.; 1 credit hour. Mr. Woolbert.

Prerequisite: The consent of the instructor.

ENTOMOLOGY

Assistant Professor FOLSOM, Dr. GLASGOW

S 1. GENERAL FIELD AND LABORATORY COURSE.—Planned to meet the needs of high-school teachers. Covers the most essential facts of entomology, emphasizing those of economic importance. Lectures, laboratory studies, and field observations. Text: Folsom's *Entomology with Reference to its Biological and Economic Aspects.* (Blakiston.) T.W.T.F., 1, 2; 405 N.H.; 2 credit hours.

S 3. ECONOMIC ENTOMOLOGY.—In the laboratory the student learns to recognize our common injurious insects in all their stages of development; in the field he gains a personal knowledge of their injurious activities. The lectures summarize the important facts relating to each insect pest, with special consideration of the most approved methods of control. M.T.W.T.F., 1, 2, and two additional hours; 408 N. H.; 3 credit hours.

Equivalent: Entomology 4.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 2. ADVANCED COURSE.—Instruction in several lines of advanced entomological study to meet the purposes of the individual student. Arrange; 405 N.H.; 2 or 3 credit hours.

S 4. ADVANCED ECONOMIC ENTOMOLOGY.—Personal work under direction on assigned problems in economic entomology, to prepare advanced students for immediate service as state and government entomologists. Those taking this course will be associated with the current operations of the State Entomologist's Office in a way to give them the advantage of practical experience in the economic field. Arrange; Ent. Building; 3 credit hours.

Prerequisite: 15 hours' credit in general and economic entomology.

Equivalent: Entomology 14.

GERMAN

Assistant Professor BLOOMFIELD, Dr. GILLET, Dr. GREEN, Dr. PUCKETT, Mr. KLINE.

S 1. BEGINNERS' COURSE.—Section A: M., 9; T.W.T.F., 8, 9; 212 U.H.; section B: M.T.W.T., 10, 11; F., 10; 311 U.H.; 4 credit

hours. Text: Gohdes and Buschek's *Sprach-und Lesebuch,* Henry Holt and Co.

A: Dr. GILLET; B: Assistant Professor BLOOMFIELD.

Equivalent: German 1.

S 2. INTERMEDIATE COURSE.—(Open to those who have had German 1 of the regular university year or an equivalent.) M.T.W.T.F. S., 8; 312 U.H.; 3 credit hours. Mr. KLINE.

Equivalent: German 3 (in part).

S 3. PROSE READING.—Narrative prose; sight reading; composition. (Open to those who have had German 3 of the regular university year or an equivalent.) M.T.W.T.F.S., 10; 312 U.H.; 3 credit hours. Mr. KLINE.

Equivalent: German 4 (in part).

S 4. Readings from the Classics.—(Open to those who have had German 4 of the regular university year or an equivalent.) M.T.W. T., 10; 212 U.H.; 2 credit hours. Dr. PUCKETT.

Equivalent: German 5 (in part).

S 5. COMPOSITION AND CONVERSATION.—Practice in the spoken and written use of simple German. M.T.W.T., 10; 215 L.H.; 2 credit hours. Dr. GREEN.

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 16.

S 6. MODERN DRAMA.—Rapid reading of representative nineteenth-century dramas. M.T.W.T., 11; 215 L.H.; 2 credit hours. Dr. GREEN.

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 24 (in part).

S 7. MODERN FICTION.—Rapid reading of representative short stories. M.T.W.T., 9; 205 L.H.; 2 credit hours. Dr. PUCKETT.

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 7 (in part).

COURSES FOR UNDERGRADUATES AND GRADUATES

S 11. HISTORY OF GERMAN LITERATURE SINCE THE REFORMATION. —Lectures; recitations; reports on assigned reading. M.T.W.T., 8; 205 L.H.; 2 credit hours. Dr. PUCKETT.

Prerequisite: Three years of university German or an equivalent.

Equivalent: German 11 (in part).

S 14. Elementary Middle High German.—Introduction to the German language and literature of the Middle Ages. M.W.F., 9; 215 L. H.; 1½ credit hours. Dr. Green.

Prerequisite: Three years of university German or an equivalent.

Equivalent: German 31 (in part).

S 16. The Development of the Drama in Europe.—Reading of representative dramas; lectures; reports.—Knowledge of French and German desirable but not required. (May be counted toward a major in German.) M.W.F., 10; 205 L.H.; 1½ credit hours.

Dr. Gillet.

Prerequisite: Junior standing.

S 17. Science of Language for Teachers.—Phonetics; applications of linguistic science to methods and practice in language-teaching. (May be counted toward a major in German.) T.T., 9; 215 L.H.; 1 credit hour. Assistant Professor Bloomfield.

Prerequisite: Senior standing.

GYMNASTICS

(See Physical Training for Men)

HISTORY

Professor F. M. Anderson, Dartmouth College, Hanover, N.H., Professor W. T. Laprade, Trinity College, Durham, N. C., Dr. A. C. Cole.

S 1b. European History, 1300–1648.—The Renaissance, the Reformation, and the Religious Wars. The development of national states and the beginnings of maritime and colonial expansion. An introductory course corresponding to the second one-third of History 1. M.T.W.T.F., 8; 311 L.H.; 2½ credit hours. Professor Laprade.

S 3c. American History, from the outbreak of the Civil War to the present time. A general survey, corresponding for the period covered, to History 3 as given during the regular university session. M.T.W.T.F., 10; 305 L.H.; 2½ credit hours. Dr. Cole.

COURSES FOR UNDERGRADUATES AND GRADUATES

(At least junior standing required.)

S 22. The West in American History, 1850–1872. Emphasis will be laid on the part played by the West in the sectional contro-

versy, in the Civil War, and in the problems of the early Reconstruction era. M.T.W.T.F., 11, 305 L.H.; 2½ credit hours. Dr. COLE.

Prerequisites: One college course in American history or its equivalent.

S 23. THE FOREIGN POLICY OF GREAT BRITAIN, 1713–1815. M.T.W.T.F., 10; 311 L.H.; 2½ credit hours. Professor LAPRADE.

Prerequisite: One college course in European history or its equivalent.

S 24. HISTORY OF FRANCE SINCE 1815.—Special attention will be given to the changes of government in 1830, 1848, 1851-2, 1870-5; the connection of France with the unification of Germany and Italy; and the political, colonial and diplomatic history of the Third Republic. M.T.W.T.F., 8; 311 L.H.; 2½ credit hours.

Professor ANDERSON.

Prerequisite: One college course in modern European history, or equivalent preparation.

COURSE FOR GRADUATES ONLY

S 101. INVESTIGATION OF SELECTED TOPICS.—Personal conferences with graduate students who desire guidance in research. Arrange. Dr. COLE.

HOUSEHOLD SCIENCE

Miss FLEMING, Miss HOPE, Miss MACKINNON

FOODS.—The work offered in foods is of two grades: (a), that designed for those who have studied or taught household science and wish to prepare themselves to teach it in high schools; (b), advanced work dealing with the general subject of nutrition.

S 1. A study of the sources and cost of foods, the cooking of various types of foods, and the combination of food as shown in the planning and service of meals. Text: Bevier and VanMeter's *Selection and Preparation of Food* (Whitcomb and Barrows, 1915). Reference work. Laboratory, M.W.F., 10, 11; Lecture, Tu., 10; Quiz, Th., 10; W. H.; 1½ credit hours. Laboratory Fee, $2.00.

Miss MACKINNON.

S 2. A study of the relative nutritive value of foods; the methods of estimating dietetic values; the relation of foods to the human body. Laboratory, T.Th., 8, 9; Lecture, M., 8; Quiz, W. F., 8; W.H.; 1½ credit hours. Laboratory Fee, $2.00. Miss MACKINNON.

Prerequisite: A year's work of college rank with foods; a year of general chemistry; a course in general physiology.

S 4. Clothing.—A study of the textiles used in clothing; discussion of the cost and care of clothing; demonstrations in the use of patterns; drafting; laboratory work in the making of clothing. Lecture and discussion, M., 2; Laboratory and demonstration, W.F., 1, 2, 3; W.H.; 2 credit hours. Miss Fleming.

Note: S 4 may be substituted for Household Science 12 with the exception of the lecture in Household Science 12.

S 5. Millinery.—Demonstrations and laboratory work in design and construction of wire, buckram, and cape net frames; the covering with velvet and straw. Demonstrations and laboratory, T. Th., 1, 2, 3; W.H.; 1 credit hour. Miss Fleming.

S 6a. Costume Design.—Lecture and laboratory work. Based on the study of appropriate dress. Proportion of parts, outline of figure and color harmony are studied. M.W.F., 10, 11; W.H.; 1½ credit hours. Miss Hope.

Note: S 6a may be taken as an equivalent for Household Science 19 by arranging with the instructor for extra work.

S 6b. House Decoration and Furnishing.—Lecture and laboratory work. History of furniture; perspective drawing of rooms; color schemes; weaving. T.Th., 10, 11; W.H.; 1½ credit hours. Miss Hope.

Note: S 6b may be taken as an equivalent for Household Science 3 by arranging with the instructor for extra work.

MANUAL TRAINING

Mr. Park, Advisor; Mr. Griffin, Mr. Duncan

The courses in Manual Arts have been arranged to satisfy the needs of three classes of students who attend the Summer Sessions; first, superintendents, principals, and teachers in small schools who pursue the work with the idea of either teaching or supervising it in their schools; second, manual arts teachers and supervisors who take the courses to increase their knowledge and experience, thus enabling them to command higher salaries; and, third, to satisfy those students in other courses who take the work to enrich their experiences.

S 1. Theory and Practice of Teaching Manual Training in the Intermediate and High Schools.—History and theory of industrial education; a study of typical schools and systems of manual arts, leading to a better understanding of the aims and methods of various schemes for the promotion of industrial education in this country; or-

ganization of work; and a study of equipments, new methods and new materials. M.T.W.T.F., 8; Lecture Room, Wood Shops, 2½ credit hours. Mr. Park.

S 2. Woodworking.—(A course for teachers in the 7th and 8th Grades and high schools.) Includes a study of tools—as uses, names of parts, adjustments, care of, and how to sharpen; the making of important joints used in wood construction and the application of these joints to the making of useful and interesting projects; the designing and making of arts and crafts furniture; notebook work, covering talks, papers, problems, etc.; strenuous work at the bench. M.T.W.T.F., 2–5; Wood Shop; 3 credit hours. Shop Fee, $5.
Mr. Park and Mr. Duncan.

S 3. Woodworking.—(A course for teachers who have completed S 2). Advanced work in cabinet making; designing and making furniture; technology of woodworking; also, some work in wood turning. M.T.W.T.F., 2–5; Wood Shop; 3 credit hours. Shop Fee, $5.
Mr. Park and Mr. Duncan.

S 4. Art Metal Work.—Includes the use and care of tools; hammering bowls, trays, and many useful articles from sheet copper, brass, and silver; work involving such processes as raising, annealing, filing, sawing or piercing, etching, repousse, enameling, and coloring; the making of art lamps, lanterns, candlesticks, boxes, furniture fittings, etc. Design is considered in relation to the project under construction. M.T.W.T.F., 9–12, or 2–5; Machine Shop; 2½ credit hours. Shop Fee, $3. Mr. Griffin.

S 5. Jewelry.—Instruction is offered in the making of buckles, fobs, chains, necklaces, pendants, rings, setting of stones; casting silver into useful shapes; polishing and finishing of metals; coloring by chemical and electrical methods. Design is considered in relation to the project under construction. M.T.W.T.F., 9–12, or 2–5; Machine Shop; 2½ credit hours. Shop Fee, $3. Mr. Griffin.

(The courses given under Art and Design, and, also, under General Engineering Drawing are of interest to Manual Arts students.)

MATHEMATICS

Professor Townsend, Dr. Crathorne, Dr. Chittenden, Mr. Frary

S 2. College Algebra.—(Equivalent to the regular university course). Text: Rietz and Crathorne's *College Algebra* (Henry Holt and Co.) M.T.W.T.F.S., 10; 419 N.H.; 3 credit hours. Mr. Frary.

Prerequisite: 2½ units entrance mathematics.

S 4. Plane Trigonometry.—(Equivalent to Mathematics 4). Text: Kenyon and Ingold's *Trigonometry,* (The Macmillan Co.) M.T.W.T.F., 11; 434 N.H.; 2 credit hours. Mr. Frary.

Prerequisite: 2½ units entrance mathematics.

S 6. Analytical Geometry.—An introductory course in plane and solid analytic geometry. Text: Dowling and Turneaure's *Analytic Geometry,* (Henry Holt and Co.). M.T.W.T.F.S., 8; 432 N.H.; 3 credit hours. Dr. Crathorne.

Prerequisite: Math. 2 and 4.

S 7. Differential Calculus.—(Equivalent to Mathematics 7.) Course in beginning calculus. Text: Townsend and Goodenough's *Essentials of Calculus,* (Henry Holt and Co.) M.T.W.T.F., 8 and 9; 431 N.H.; 5 credit hours. Dr. Chittenden.

Prerequisite: Math. 6.

S 9. Integral Calculus.—(Equivalent to Mathematics 9.) Text: Townsend and Goodenough's *Essentials of Calculus,* (Henry Holt and Co.) M.T.W.T.F.S., 9; 425 N.H.; 3 credit hours.

Professor Townsend.

Prerequisite: Math. 7.

courses for graduates only

S 102. Advanced Calculus.—An extension of the first course in calculus (Math. 7, 9) to the properties of functions of two or more variables, including such topics as implicit functions, total and partial differentiability, functional determinants, line and surface integrals, proper and improper double integrals, etc. The application of these properties to problems in geometry and mechanics is considered so far as time permits. The course is based for the most part upon Goursat-Hedrick's *Mathematical Analysis,* Vol. I (Ginn & Co.). M. T.W.T.F., 8; 435 N.H.; 1 graduate unit. Professor Townsend.

Prerequisite: Math. 7, 9.

S 105. Calculus of Variations.—A study of the necessary and sufficient conditions for a maximum or minimum value of a definite integral according to the methods of Weierstrass, Kneser, and Hilbert. Applications of the calculus of variations to other branches of mathematics and to physics are taken up. Lectures supplemented by problems and assigned reading. M.T.W.T.F., 9; 435 N.H.; 1 graduate unit. Dr. Crathorne.

Prerequisite: Math. 16.

MECHANICS, THEORETICAL AND APPLIED

Mr. Seely, Mr. Ensign, Mr. Vallance

S 10. Hydraulics.—Text-book and laboratory work. The laws of the pressure and the flow of water and its utilization as motive power are considered. Experimental work in the observation and the measurement of pressure, velocity, flow, power and efficiency, and in the determination of experimental coefficients. Hoskin's *Text-book on Hydraulics.* M.T.W.T., 1; 202 L.A.M.; T.T.; 8-10; Hyd. Lab.; 3 credit hours. Mr. Vallance.

Prerequisite: Theoretical and Applied Mechanics 21.

Note: Arrangements may be made to use the facilities of the hydraulic laboratory for special experimental work during the summer session.

S 14. Elements of Mechanics.—The principles of kinematics, kinetics, and statics and their application. Morley's *Mechanics for Engineers.* (For Architects and others who have not taken the calculus.) M.W.F.S., 8, and T.T., 8–10; 202 E.H.; 4 credit hours.

Mr. Ensign.

Prerequisite: Mathematics 2, 4.

S 20. Analytical Mechanics.—This course includes the first half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* M.T.W.T.F.S., 10; 202 E.H.; 3 credit hours. Mr. Ensign.

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 21. Analytical Mechanics.—This course includes the second half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* M.T.W.T., 10; 208 E. H.; 2 credit hours. Mr. Seely.

Prerequisite: Mathematics 9 and Theoretical and Applied Mechanics 20.

S 25. Resistance of Materials.—The mechanics and properties of materials used in construction, experiments in the testing laboratory, problems in the application of principles. Merriman's *Mechanics of Materials.* M.T.W.T.F.S., 11; 208 E.H.; M.W., 8–10; L.A.M.; 4 credit hours. Mr. Seely, Mr. Vallance.

Prerequisite: Mathematics 9, Theoretical and Applied Mechanics 20.

MUSIC

Director Erb, Miss Wallace

S 1. Musical History.—Biography, including critical discussions of important compositions, and the investigation of national

tendencies in modern music. Collateral reference work and note books are required. M.T.W.T., 9; 126 U.H.; 2 credit hours. (School of Music.) Director ERB.

S 2. ADVANCED HARMONY.—The Septchords: including Dominant and secondary sevenths, also the Dominant ninth. Harmonization with three clefs on four staffs; Sequences; study of key relations and simple diatonic modulations; Harmonic analysis commenced; Keyboard work. M.T.W.T., 10; 126 U.H.; 2 credit hours. (School of Music.) Director ERB.

S 3. HARMONY.—Summary and drill in scales and keys, intervals, triad construction and connection; derivation and figured bass from given melody, harmonization in two clefs. M.T.T.F., 11; 126, U.H.; 2 credit hours. (School of Music.) Miss WALLACE.

S 4. SIGHT, ADVANCED COURSE.—Drill in one, two, three, and four part reading; suitable exercises for breath control, enunciation and phrasing. M.T.T.F., 2; 126 U.H.; 1 credit hour (School of Music.) Miss WALLACE.

S 5. SINGING, ELEMENTARY COURSE.—Music notation; scale structure; ear and eye training; solfeggio. Tu.F., 3; 126 U.H.; no university credit. Miss WALLACE.

Campus sings every Wednesday evening at 6:45, Auditorium steps.

PHYSICAL TRAINING

ATHLETIC COACHING

Director HUFF, Mr. GILL, Mr. JONES, Mr. ZUPPKE, Mr. GLIMSTED.

Note: Courses in Physical Training for men will continue through only 6 weeks. Not more than 5 credit hours in physical training may be counted for graduation in any one of the colleges of the University.

S 10. BASEBALL.—Theory and Practice in batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules; physical condition; methods of indoor practice. Lectures and practical work. M.T.W.T., 3–5; 1½ credit hours. Director HUFF.

S 11. TRACK AND FIELD ATHLETICS.—Instruction and practical demonstration in starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; practical talks on methods of preparing contestants for different athletic events; adaptations to individual peculiarities; rules of competition; study of physical condition, including endurance, speed,

fatigue, and all means of training for condition; work is assigned for the promotion, management, and officiating of games and meets. Lectures and practical work. W.T.F.S., 10–12. 1½ credit hours.

Mr. GILL.

S 12. BASKETBALL.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. Lectures and practical work. M.T.W.T., 1–3; 1½ credit hours. Mr. JONES.

S 13. FOOTBALL.

Theoretical:

a. Rules from the standpoint of coach, players, and officials.
b. Several styles of offense and defense with consideration of their special strengths and weaknesses.
c. Generalship and strategy.

Practical:

a. Training, conditioning, and players equipment.
b. Punting, drop kicking, place kicking, kick off, and forward passing.
c. Tackling dummy and charging sled.
d. Special drills for linemen, ends, and backs.
e. Following the ball, interference, and team work.
f. Fundamental plays, freak plays, and signal systems.

Lectures and practical work. M.T.F.S., 8–10. 1½ credit hours.

Mr. ZUPPKE.

S 14. TRAINING.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S 10, S 11, S 12, or S 13. W.Th., 9; ½ credit hour. Mr. GLIMSTED.

GYMNASTICS

Mr. MAUTHE (Director of Physical Education, Stout Institute, Menominee, Wisconsin), Mr. FARGO

S 15. Calisthenics.—Typical lessons for corrective and responsive work given. Simple drills with wands, dumb-bells, and bar-bells.

(a) Practice and instruction by imitation and command. Emphasis to be laid on hygienic work which permits large classes to be handled effectively.

(b) Pedagogy. Theory work in nomenclature. The importance of correct posture is emphasized. Methods of roll call, squad division, organization, and control.

M.Tu.T.F., 10–11; Gym., ⅓ credit hour. Mr. Fargo.

S 16. Elementary Swedish Gymnastics.—Simple floor work and elementary exercises on apparatus. Attention given to the laws of progression, form, control, and execution. W.Th.F., 2–3; Gym.; ⅓ credit hour. Mr. Fargo.

S 17. Elementary Gymnastics; Heavy Apparatus.—Elementary exercises on heavy apparatus, mats, horse, horizontal bar, rings, and parallel bars. Accuracy of form and completeness of execution emphasized. The chief purpose being to teach a large variety of rapid mass work which is adapted to the average class which men will have to teach. M.T.W.T.F., 5–6; Gym.; ½ credit hour. Mr. Fargo.

S 18. Intermediate Heavy Gymnastics.—More advanced work along the same lines as Course S 17. The laws of gymnastic progression will be emphasized. Nomenclature, analysis, and synthesis of exercises and the use of heavy apparatus. M.T.W.T.F., 5–6; Gym.; ½ credit hour. Mr. Fargo.

S 19. Advanced Gymnastics; Heavy Apparatus.—Advanced exercises on heavy apparatus; nomenclature; skill, form, and accuracy of execution emphasized. M.T.W.T.F., 5–6; Gym.; ½ credit hour. Mr. Fargo.

Note: Courses S 17, S 18, and S 19, will be given at the same hour. Students registered will be placed in whatever grade of work they seem to belong, according to former experience and ability.

S 20. Advanced Gymnastics with Light Apparatus.—Advanced exercises with light apparatus; wands, dumb-bells, single sticks, bar-bells, and Indian clubs. Continuation of Course S 15 a. M. Tu.W.F., 9–10; Gym.; ½ credit hour. Mr. Mauthe.

S 21. Gymnastic Dancing for Men.—Elements of steps, simple steps, and series of dancing steps to be given to classes in single file, pairs, and in open order. M.Tu.W.T., 11–12; Gym.: ½ credit hour. Mr. Mauthe.

S 22. Advanced Gymnastic Dancing.—Advanced material as a continuation of Course S 21. W.Th., 1–2; Gym.; ½ credit hour. Mr. Mauthe.

S 23. School Room Gymnastics.—Gymnastic games, exercises, and simple folk dances for all grades adapted to meet conditions of schoolroom and gymnasium. W.Th.F., 8–9; Gym.; ⅓ credit hour. Mr. Mauthe.

PHYSICAL TRAINING FOR WOMEN

Miss Brooks

S 1. Plays, Games and Folk-Dances.—Designed for teachers who coach high-school girls in team games or supervise grammar-school games. The course will include instruction in methods of varying the problems involved; the grading of games; team games for girls with especial reference to basket ball; the comparative value of the various rules used by girls' teams, (a) from the coach's point of view, (b) from the player's point of view; value of center ball, goal relay, and other team games in working up to basket ball; the training of the captain in her duties: training in team work; combination plays, guarding, various throws, etc.

Instruction in the teaching of folk-dances and singing games for the playground and school. Lectures and practical work. M.W.F., 9-11; 1 credit hour. Miss Brooks.

S 2. Swimming.—Classes in beginning and advanced swimming. M.T.W.T.F., 11, 2, 3, 4; no credit. Miss Brooks.

PHYSICS

Associate Professor Knipp, Dr. Williams, Messrs. Warner, Bayley, Fazel and Booth.

S 7I. General Physics Part I.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. Text: Kimball's *College Physics*. M.W.F., 11; Lecture Room 119, Physics Building; 1½ credit hours.

Associate Professor Knipp, Mr. Bayley.

Prerequisites: Plane geometry and high-school algebra; registration in Physics S 8I. Plane trigonometry desired.

Equivalent: S 7 (I, II, III) together with S 8 (I, II, III) are equivalent to Physics 7a–7b, 8a–8b for the college year.

S 8I. Introductory Laboratory Physics Part I.—A laboratory course in physical measurements on mechanics, properties of matter, etc., to accompany S 7I. Text: Schulz's *Laboratory Manual*. M.W.F., 2-4; 212 Physics Building; 1½ credit hours.

Mr. Bayley.

Prerequisite: Registration in Physics S 7I.

Equivalent: See S 7I.

[S 7II. General Physics Part II.—Experimental Lectures with recitations on electricity and magnetism. Text: Kimball's *College Physics.* 1½ credit hours. Given in 1915; not given in 1916; will be given in summer of 1917.

Prerequisites: See S 7I.

Equivalent: See S 7I.]

[S 8II. Introductory Laboratory Physics Part II.—A laboratory course in electricity and magnetism to accompany S 7II. Text: Schulz's *Laboratory Manuel.* Given in 1915; not given in 1916.

Prerequisite: Registration in S 7II.

Equivalent: See S 7I.]

S 7III. General Physics Part III.—Lectures with experimental demonstrations and recitations. Topics treated will be heat, light, and sound. Text: Kimball's *College Physics.* T.T.S., 11; Lecture Room 119, Physics Building; 1½ credit hours.

Associate Professor Knipp, Mr. Booth.

Prerequisite: Same as S 7I.

Equivalent: See S 7I.

S 8III. Introductory Laboratory Physics Part III.—A laboratory course in which the fundamental experiments in heat, light and sound are performed, to accompany S 7III. Text: Schulz's *Laboratory Manual.* T.T., 2-4; S., 8-10; 212 Physics Building, 1½ credit hours.

Mr. Warner, Mr. Booth.

Prerequisite: Registration in Physics S 7III.

Equivalent: See S 7I.

S 4. Electrical and Magnetic Measurements.—An advanced laboratory course with discussions, recitations and reports. Students in electrical engineering whose work is irregular can do the first semester of electrical measurements in the Summer Session and finish with the class during the second semester. No text required. M.T.T.F., 1-4; 112 Physics Building; 2 credit hours.

Dr. Williams, Mr. Fazel.

Prerequisite: A course in general physics and calculus.

Equivalent: First semester of Physics 4.

S 15. Electricity and Magnetism.—Lectures, recitations and laboratory work. The course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses in general physics. The apparatus and laboratory methods used call for high accuracy. Text:

Brooks & Poyser, *Magnetism and Electricity.* M.W., 8; F., 1-4; 108 Physics Building; 1½ credit hours.

Dr. WILLIAMS, Mr. FAZEL.

Prerequisite: A course in general physics.

Equivalent: Physics 15 (in part).

S 16. HEAT.—Lectures and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, expansion, vapor pressure, etc. This is an intermediate course recommended to students who have already had a course in general physics and desire a more extended knowledge of heat. Text: Edser's *Heat for Advanced Students.* T.T., 10; W., 1-4; 213 Physics Building; 1½ credit hours.

Mr. WARNER, Mr. BOOTH.

Prerequisite: A course in general physics.

Equivalent: Physics 16 (in part).

[S 17. LIGHT.—A course of lectures and recitations on reflection, refraction, interference, diffraction and polarization, followed by laboratory experiments on these phenomena, and the theory and use of optical instruments, such as telescopes, microscopes, refractometers, prism and grating spectroscopes, interferometers, etc. Text: Edser's *Light for Students;* 1½ credit hours. Given in 1915; not given in 1916; probably will be given in summer of 1917.

Prerequisite: A course in general physics.

Equivalent: Physics 17 (in part).]

S 18. TEACHERS' COURSE.—This course is in two parts. Part I consists of discussions of methods of organizing laboratory work, quizzes and class demonstrations, criticisms of high-school text-books, principles of selecting and ordering apparatus, etc. Part II consists of practical laboratory manipulation, such as glass blowing, minor repairs of apparatus, processes of preparation of direction sheets, etc. T.T., 8; 208 Physics Building; 1 credit hour.

Dr. WILLIAMS.

Prerequisite: A course in general physics, or teaching experience in physics.

Equivalent: Physics 18 (in part).

S 24. PROPERTIES OF MATTER.—The fundamental properties of matter, weight, mass, gravitation, elasticity, viscosity, surface tension, and diffusion. Lectures and recitations. Laboratory measurements including the use of the dividing engine, chronograph, etc.

Poynting and Thomson's *Properties of Matter*.. M.W., 9; S., 8-11; 208 Physics Building; 1½ credit hours.

Dr. WILLIAMS.

Prerequisite: A course in general physics.

Equivalent: Physics 24 (in part).

S 21. RECENT ADVANCES IN PHYSICAL SCIENCE.—See S 126. Physics Colloquium.

COURSE FOR UNDERGRADUATES AND GRADUATES

S 31. SPECIAL PROBLEMS IN ADVANCED PHYSICAL MEASUREMENTS.—Special laboratory problems such as the accurate determination of the value of H, the horizontal component of the earth's magnetic intensity; of the self-induction, L, of a coil; of the capacity, C, of a condenser in absolute measure; the calibration of a bridge wire; the determination of e/m and v of the electron; the adjustment of an electrometer and the determination of its capacity, etc. Text: *Various Laboratory Manuals.* 1 or 2 credit hours. Arrange time. Associate Professor KNIPP, Dr. WILLIAMS.

Prerequisite: A course in general physics, calculus.

COURSES FOR GRADUATES ONLY

S 126. PHYSICS COLLOQUIUM.—Weekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems. A few of these papers are on investigations in progress in the laboratory and experimental demonstrations are used. Attendance is expected of all graduate students. Undergraduates who are especially interested in physics as teachers or otherwise, are advised to attend. Thursday, 6:45-8:00 p. m.; 201 Physics Building.

Associate Professor KNIPP, Dr. WILLIAMS.

The plan for the summer of 1916 is to devote three of these colloquium periods to popular lectures, illustrated by experiments, on the more recent and important advances in physical science. These lectures are by members of the physics instructional staff and are open to all students in the Summer Session interested. The subjects and dates follow:

Electric Discharge in Vacuum Tubes—the Electron, Thur., July 6, 6:45; 100 Physics Building. Associate Professor KNIPP.

Electric Discharge in Air—Lightning, Thur., July 20, 6:45; 100 Physics Building. Mr. WARNER.

Liquification of Gases, Thur., Aug. 3, 6:45; 100 Physics Building.
Dr. WILLIAMS.

A physics exhibit will be held immediately following the lecture on August 3. The laboratories, research rooms, and the department shop will be open for inspection. It is planned to have a number of instructive experiments on exhibition.

S 131. INVESTIGATION OF SPECIAL PROBLEMS.—This course is intended for students who expect to work for advanced degrees. The work done should show originality in method, or should contribute new data in experimental investigation.

Associate Professor KNIPP, Dr. WILLIAMS.

Prerequisite: Registration in Graduate School. See instructor.

S 133. SEMINARY AND THESIS.—

Associate Professor KNIPP, Dr. WILLIAMS.

Prerequisite: Registration in Graduate School. See instructor.

POLITICAL SCIENCE

Professor ANDERSON, (Dartmouth College,) Dr. MEZ, (Carnegie Endowment for International Peace.)

S 1. AMERICAN GOVERNMENT.—Historical development, organization, powers, limitations, and practical working of the national government. M.T.W.T.F., 2; 2½ credit hours.

Assistant Professor MATHEWS.

S 2. AMERICAN DIPLOMACY.—Genesis and present organization of the Department of State; the diplomatic service; the treaty making power; the methods and traditional principles of the foreign policy of the United States; diplomatic controversies with foreign powers; the United States as a world power. M.T.W.T.F., 3; 2½ credit hours.

Assistant Professor MATHEWS.

S 3. THE GOVERNMENTS OF EUROPE.—The national governments of Great Britain, France, Germany, Austria-Hungary, Russia, Italy, and Switzerland; development and practice of the British cabinet system; constitutional beginnings of the continental governments; political parties; methods of legislation. M.T.W.T.F., 9; 2½ credit hours.

Professor ANDERSON.

ROMANCE LANGUAGES

FRENCH

Associate Professor CARNAHAN, Dr. MOORE, Mr. CARRY

S 1a. ELEMENTARY COURSE.—Pronunciation, grammar, composition, reading of easy texts. Giese's *Graded French Method* (Henry Holt & Co.) will be the introductory textbook. M., 9; T.W.T.F., 8, 9; 211 L.H.; 4 credit hours. Dr. MOORE.

Equivalent: French 1b, second semester.

S 1b. ELEMENTARY COURSE (continued).—Open to capable students by special arrangement with the instructor. 4 credit hours. Mr. CARRY.

Prerequisite: French 1a. (Elementary French, first semester), S 1, or one year of high-school French.

Equivalent: French 1b, second semester.

S 2. READING OF MODERN FRENCH.—Rapid reading of modern authors, composition, conversation. Texts: Loti's *Pêcheur d'Islande;* Mérimée's *Colombia;* Erckmann-Chatrian's *Le Juif Polonais;* Bazin's *Les Oberlé;* Hugo's *Ruy Blas;* Scribe's *Bataille de Dames.* M.T.W.T.F.S., 10; 117 L.H.; 3 credit hours. Mr. CARRY.

Prerequisite: One year of university French or an equivalent.

Note: Students securing a grade of 85 or more who desire to earn one additional credit hour so as to make this course the equivalent of French 2 first semester of the regular university course, may do so upon approval of the instructor and by fulfilling additional requirements of assigned work. Such additional credit must, however, be indicated at the time of registration.

S 3. CONVERSATION.—Practice in speaking and writing simple French. As a basis for conversation Allen and Schoell's *French Life* (Henry Holt & Co.) will be used. M.W., 11; 117 L.H.; 1 credit hour. Mr. CARRY.

Prerequisite: The approval of the instructor. A good knowledge of French grammar and an ability to read ordinary French prose will be the basis of his judgment.

S 4. COMPOSITION AND CONVERSATION. (intermediate course).—Conducted in French. Textbooks: Talbot's *French Prose Composition* (Benjamin H. Sanborn), Talbot's *Le Français et sa Patrie* (Benjamin H. Sanborn.) T.T., 11; 117 L.H.; 1 credit hour. Mr. CARRY.

Prerequisite: Ability to understand spoken French, and the approval of the instructor.

S 9. Modern French Drama.—Rapid reading of modern plays, not including those read in course S 8 in 1915. Collateral reading. T.T., 8; 216 L.H.; 1 credit hour.

Associate Professor Carnahan.

Prerequisite: Two years of university French, or an equivalent.

COURSE FOR GRADUATES ONLY

S 100. Seminar.—An opportunity for graduate work in French literature will be afforded for properly qualified students. Arrange; 214 L.H. Dr. Moore.

SPANISH

Mr. Laguardia

S 1a. Elementary Course.—Grammar, reading of easy texts. Edgren and Ingraham's *Spanish Grammar* (D. C. Heath & Co.). M., 9; T.W.T.F., 8, 9; 117 L.H.; 4 credit hours.

Mr. Laguardia.

Equivalent: Spanish 1a. (Elementary Spanish first semester.)

S 2. Conversation, Composition and Reading.—The vocabulary of everyday life is emphasized. Commercial correspondence. M.W.F., 11; 211 L.H.; 1 credit hour.

Mr. Laguardia.

Prerequisite: One year of university Spanish or an equivalent.

Note: Students securing a grade of 85 or more who desire to earn additional credit so as to make this course the equivalent of Spanish 2 first semester of the regular university course, may do so upon approval of the instructor and by fulfilling additional requirements of assigned work. Such additional credit must, however, be indicated at the time of registration.

SOCIOLOGY.

Professor Lichtenberger (University of Pennsylvania)

S 1. Social Causation.—This course deals with the subject of cause and effect in society. The processes of causation, so thoroughly established in all other sciences, are traced in the various aspects of human society with special reference to problems of population, the activities and expressions of the social mind, the development of social organization and the direction of social progress. T.W.T.F., 9; 306 L. H., 2 credit hours.

Professor Lichtenberger.

S 5. Practical Social Problems.—A survey of the most important contemporary social-civic problems, such as: public health, child welfare, labor problems, recreation, women in industry, poverty, crime, immigration, alcoholism, eugenics, etc. The course deals with practical and concrete material, but includes a study of principles of interpretation, and methods of reform. T.T., 10; 306 L. H.; 1 credit hour.

Professor Lichtenberger.

COURSE FOR UNDERGRADUATES AND GRADUATES

S 15. The Family.—The study of the origin and evolution of the family. Primitive customs and ceremonies. Theories of marriage. The family in modern life. The problem of divorce,—causes and remedies. The stability of the family and the fundamental necessity of its preservation. Present hopeful tendencies. The course is conducted by the seminar method—the preparation and discussion of papers. Undergraduate students admitted only upon consultation with the instructor. T.W.T.F., 8; 306 L. H.; 2 credit hours.

Professor Lichtenberger.

ZOOLOGY

Assistant Professor Shelford, Mr. Baldwin

COURSES FOR UNDERGRADUATES

S 1. General Zoology.—The nature of living matter, principles underlying functional activities, heredity, evolution, and geographic distribution. Lecture or quiz 4 hours per week, laboratory 8 hours per week. The lectures, quizzes, and 6 hours laboratory, M.T.W.T.F., 10-12; an additional 2 hours of laboratory selected within the following periods: Th. 8-10; T. or Th., 1-4; 312 N. H.; 4 credit hours. Laboratory fee, $2.00.

Assistant Professor Shelford, Mr. Baldwin.

S 13. Elements of Embryology and Microposcopical Technique.—Laboratory work with occasional lectures and quizzes. Intended to introduce the student to the fundamental features of cell structure and of animal development through contact with examples chosen from common animals and utilized to give training in the simpler methods of preserving, sectioning, and mounting. T. Th., 1-4; the student chooses two hours from each period; attendance required 2-3; 310 N. H.; 2 credit hours. Laboratory fee, $2.00.

Mr. Baldwin.

COURSE FOR GRADUATES AND ADVANCED UNDERGRADUATES

S 9. ANIMAL ECOLOGY.—The relations of animals to their natural environments. Field and experimental work and lectures on the natural history of mammals, birds, reptiles, and amphibians. 2 or 4 credit hours. Lectures, T. Th., 9; 229 N. H.; Laboratory M. F., 8-10; 202 V. B., or field, S., 8-12 for 2 credit hours; or all M. F. and S. meetings and four additional hours of laboratory or field work at hours arranged for 4 credit hours. Laboratory fee, $2.00

Assistant Professor SHELFORD

COURSE FOR GRADUATES ONLY

S 125. ANIMAL ECOLOGY AND BEHAVIOR.—Individual Research course. Hours to be arranged; 201 V.B.; ½ to 2 graduate units. Laboratory fee, $2.00.

Assistant Professor SHELFORD.

University of Illinois Location

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, at the junction of the Wabash, the Illinois Central, and the Cleveland, Cincinnati, Chicago & St. Louis railroads. The cities of Urbana and Champaign have together a population of 24,000.

The institution was incorporated February 28, 1867, under the name, the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred thirty-five acres, besides a farm of about eight hundred fifty acres. The buildings at Urbana are forty-six in number, chief of which are the Agricultural Building, the Agronomy Buildings, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the

Library Building, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, the Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop, Foundry, Commerce Building, Transportation Building, the New Armory, Stock Judging Pavilion, Administration Building, Vivarium Building, and Ceramics Building. Plans have been prepared and a site chosen for the School of Education Building.

Libraries

The University library, at Urbana, contains 326,000 volumes, and subscribes for over 3,400 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 8,700 volumes and 39,000 pamphlets.

The library is housed, for the most part, in the library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

Athletics

Although both the men's and women's gymnasium will be used in some parts of the regular class work in Physical Training, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums are well equipped. Each contains swimming pool, shower, and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts upon the University campus are open to the student body. The general athletic fields will be open to the students. The golf links, which are near the southern extremity of the University property, will also be available. Students interested in any of these forms of sport would do well to bring whatever costumes or apparatus they may own, such as tennis racquets, golf sticks, base ball clubs, etc.

Play Ground

Miss Verna Brooks of the department of physical training for women, will offer a course designed for teachers who coach high-school girls or supervise grammar-school games.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $3.75 to $4.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or

W. C. Bagley, Director
W. S. Miller, Secretary
Room 203, University Hall,
Urbana, Illinois.

The University of Illinois

Summer Session

June 18 to August 10, 1917

(For candidates for A. M., 9 weeks; for courses in Physical Training and Library Science, 6 weeks.)

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UNIVERSITY OF ILLINOIS

EDMUND JANES JAMES, Ph.D., LL.D., President of the University.

KENDRIC CHARLES BABCOCK, Ph.D., LL.D., Dean of the College of Liberal Arts and Sciences; *Director of the Summer Session.* (Office, 304 University Hall.)

JOHN ALFORD STEVENSON, A.M., Secretary of the School of Education. (Office, 203 University Hall.)

CHARLES MAXWELL MCCONN, A.M., Registrar. (Office, 156 Administration Building.)

LLOYD MOREY, A.B., B.Mus., C.P.A., Acting Comptroller.

CALENDAR

SUMMER SESSION, 1917

June 18, Monday	Registration Day
August 9 and 10, Thursday and Friday	Final Examinations

FIRST SEMESTER, 1917-18

September 10 to 14, Monday to Friday	Entrance Examinations
September 17 and 18, Monday and Tuesday	Registration Days
September 19, Wednesday, 8 a.m.	Instruction Begins

ANNUAL REGISTRATION OF STUDENTS

ALL DEPARTMENTS

'94-'95	810
'95-'96	855
'96-'97	1059
'97-'98	1582
'98-'99	1824
'99-'00	2225
'00-'01	2505
'01-'02	2932
'02-'03	3289
'03-'04	3592
'04-'05	3734
'05-'06	4091
'06-'07	4318
'07-'08	4746
'08-'09	4979
'09-'10	5118
'10-'11	5217
'11-'12	5200
'12-'13	5087
'13-'14	5539
'14-'15	5956
'15-'16	6427
'16-'17	6828

STAFF OF INSTRUCTION

SUMMER SESSION, 1917

Adams, Roger, Ph.D., Assistant Professor of Organic Chemistry
Allen, Paul William, M.S., Instructor in Dairy Bacteriology
Anderegg, Frederick Osband, Ph.D., Instructor in Chemistry
Anderson, David Allen, Ph.D., Associate Professor of Education, University of Washington, Seattle, Washington
Ball, Theodore Rolly, Ph.D., Instructor in Chemistry
Barto, Daniel Otis, B.S., Associate in Poultry Husbandry
Barton, Herbert Jewett, A.M., Professor of Latin
Bilik, Samuel, D.N., Assistant in Physical Training
Blackwelder, Eliot, Ph.D., Professor of Geology
Bond, Ethel, A.B., B.L.S., Instructor in Library Science
Booth, Harry Tyler, M.S., Assistant in Physics
Borden, Raymond Franklin, A.M., Assistant in Mathematics
Britton, William Everett, A.M., J.D., Instructor in Business Law
Brooks, Fannie Maria, A.B., Assistant in Home Economics Demonstration
Carter, Alice, A.B., Assistant in Household Science
Chittenden, Edward Wilson, Ph.D., Instructor in Mathematics
Cloud, Eva, Lecturer (Kewanee Public Library)
Crawford, Clayton DeLisle, LL.B., Professor of Public Speaking, Beloit College, Beloit, Wisconsin
Curme, George Oliver, Litt.D., Professor of Germanic Philology, Northwestern University, Evanston, Illinois
Cushman, Robert Eugene, A.B., Instructor in Political Science
Dickinson, Edwin Dewitt, A.M., Assistant Professor of Political Science, Dartmouth College, Hanover, New Hampshire. (Appointed through co-operation with the Carnegie Endowment for International Peace)
Dodge, Daniel Kilham, Ph.D., Professor of English
Duncan, James Merion, Assistant in Mechanical Engineering
Emch, Arnold, Ph.D., Assistant Professor of Mathematics
Ensign, N. E., B.S., Associate in Theoretical and Applied Mechanics
Erb, John Lawrence, F.A.G.O., Director of the School of Music
Fargo, Roy Newton, B.S., Director of the Men's Gymnasium
Fazel, Charles Stevens, A.M., Assistant in Physics
Fernsemer, Oscar Friedrich Wilhelm, Ph.D., Instructor in German

Folsom, Justus Watson, D.Sc., Assistant Professor of Entomology
Frary, Hobart Dickinson, M.E., M.S., Fellow in Mathematics
Gill, Harry Lovering, Associate in Track Athletics
Glasgow, Robert Douglas, Ph.D., Instructor in Entomology
Goodenough, George Alfred, M.E., Professor of Thermodynamics
Griffith, Ira Samuel, A.B., Associate Professor of Manual Arts, University of Missouri, Columbia, Missouri
Gusler, Gilbert, B.S., Associate in Animal Husbandry
Hayes, Edward Cary, Ph.D., Professor of Sociology
Hollister, Horace Adelbert, A.M., Professor of Education and High School Visitor
Hornbeck, John W., Ph.D., Professor of Physics, Carleton College
Hope, Leona, Instructor in Household Science
Hopkins, B. Smith, Ph. D., Associate in Chemistry
Hottes, Charles Frederick, Ph. D., Professor of Plant Physiology
Howell, Lloyd Brelsford, A.B., Assistant in Organic Chemistry
Huff, George A., Director of Physical Training for Men
Hyslop, William Henry, A.M., Assistant in Physics
Johnston, Charles H., Ph.D., Professor of Secondary Education
Jones, Harry Stuart Vedder, Ph.D., Assistant Professor of English
Kamm, Oliver, Ph.D., Instructor in Chemistry
Karr, Walter Gerald, M.S., Assistant in Chemistry
Knipp, Charles Tobias, Ph.D., Associate Professor of Physics
Koller, Armin Hajman, Ph.D., Instructor in German
Kremers, Harry Cleveland, M.S., Assistant in Chemistry
Kunz, Jakob, Ph.D., Associate Professor of Physics
Lake, Edward John, B.S., Assistant Professor of Art and Design
Lamoreaux, Madge, B.S., Assistant in Household Science
Layton, Warren Kenneth, A.B., Assistant in Education
Lewis, Howard Bishop, Ph.D., Associate in Physiological Chemistry
Lybyer, Albert Howe, Ph.D., Professor of History
McDougall, Walter Byron, Ph.D., Instructor in Botany
MacKinnon, Jean Gilbert, A.M., Instructor in Household Science
Miller, George Abram, Ph.D., Professor of Mathematics
Moulton, Gertrude, Formerly Director of the Woman's Gymnasium
Nasmyth, Heber Dignam, Instructor in Voice
Nelson, Roy Andrew, M.S., Assistant in Physics
Newlon, Jesse H., A.M., Principal of High School, Lincoln, Nebraska
Nicolet, Tell William, A.B., Instructor in Landscape Gardening

Nolan, Aretas Wilbur, M.S., Assistant Professor of Agricultural Extension
Nordmeyer, Heinrich Waldemar, Ph.D., Instructor in German
O'Gorman, James W., A.M., Instructor in Education
Parsons, Maude Edna, A.B., Associate in Household Science
Pattee, Fred Lewis, A.M., Litt.D., Professor of English Literature, Pennsylvania State College, State College, Pennsylvania
Paul, Harry Gilbert, Ph.D., Associate Professor of the English Language and Literature
Phillips, Paul C., Ph.D., Professor of History, University of Montana
Pickett, Bethel Stewart, M.S., Assistant Professor of Pomology
Putnam, William James, B.S., Instructor in Theoretical and Applied Mechanics
Rhoton, Alvis L., A.M., Professor of Pedagogy, Georgetown College, Georgetown, Kentucky
Richardson, Clarence Hudson, B.D., Assistant in Mathematics
Roberts, Elmer, B.S., Instructor in Genetics
Russell, Frederic Arthur, Ph.D., Instructor in Economics
Scovill, Hiram Thompson, A.B., Instructor in Accountancy
Sears, George Wallace, Ph.D., Instructor in Chemistry
Seitz, Eugene, Assistant Supervisor of Physical Training, Kansas City, Missouri
Smiley, Charles N., Ph.D., Professor of Latin, Grinnell College
Smith, Frank, A.M., Professor of Systematic Zoology
Sparks, Marion Emeline, A.M., Librarian in the Chemical Library
Stevenson, John Alford, A.M., Assistant and Secretary in the School of Education
Stewart, Charles Leslie, Ph.D., Instructor in Economics
Stewart, Robert, Ph.D., Associate Professor of Soil Fertility
Swinney, Edward Earle, A.B., Instructor in Public School Music
Thompson, Charles M., Ph.D., Assistant Professor of Economics
Tieje, Ralph Earl, A.M., Fellow in English
Treat, Edna Almeda, B.Mus., Instructor in Music
Vought, Sabra W., A.B., B.L.S., Instructor in Library Science
Van Cleave, Harley Jones, Ph.D., Associate in Zoology
Wahlin, Gustav Eric, Ph.D., Associate in Mathematics
Walworth, Edward Harvey, B.S., Instructor in Crop Production
Watson, Floyd Rowe, Ph.D., Associate Professor of Physics
Weirick, Bruce, A.M., Instructor in English
White, Earl A., M.S., Assistant Professor of Farm Mechanics
Zuppke, Robert Carl, Ph.B., Associate in Football

GENERAL STATEMENT

The Summer Session of the University of Illinois for 1917 will open on June 18, and close on August 10, making a term of *eight weeks,* or one-half a semester, for all students except graduate students who are candidates for a master's degree, for whom the prescribed term is *nine* weeks, and except students taking only courses in library science, physical training for men or athletic coaching, for whom the term is *six* weeks from June 18. The opening day will be devoted to registration. The final examinations will be held on Thursday and Friday of the last week.

All of the courses, except those in library science and physical training for men, will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Session a certificate for such attendance, but university credit will not be given for six-weeks' courses, except for those in physical training for men and in athletic coaching.

The number of credit hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight credit hours or less.

Purpose

The Summer Session is an organized integral part of the University year. Though its organization is not subdivided into colleges, numerous courses are offered by departments in the Colleges of Liberal Arts and Sciences, Commerce, Agriculture, Engineering, and in the School of Music and the Library School. All courses may be counted toward an A.B. or B.S. degree, or toward a master's degree, unless otherwise specified. By two Summer Sessions a regular student may reduce the eight semesters to seven, thus securing his degree a half year earlier than he would otherwise have done.

One of the primary purposes of the Summer Session is to meet the needs of the teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. Numerous courses are designed particularly for high-school teachers, supervising officers, teachers of special subjects (agriculture, art, household science, manual training, music, etc.), and coaches of athletic teams; graduate courses are offered for college instructors, school supervisors, and principals who are working for advanced degrees.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the college of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the university, including in the case of each college certain subjects especially prescribed for admission to that college.

The subjects prescribed for admission to the *College of Liberal Arts and Sciences* for all curriculums leading to the degree of Bachelor of Arts (including the *general curriculum in liberal arts and sciences,* the curriculums in *journalism, household science,* and *medicine,* and the curriculum *preliminary to law*) are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units must be in the same language). Seven elective units are required to make up the total of 15 units.

For the curriculum in *chemistry* in the *College of Liberal Arts and Sciences* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units; German or French, 2 units. Six elective units are required to make up the total of 15 units. The prescribed subjects for admission to the curriculum in *chemical engineering* are the same, except that the option between German and French is not given; German is required.

For the *College of Engineering* the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit; laboratory science, 1 unit. Eight elective units are required to make up the total of 15 units.

For the *College of Agriculture* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

For the *School of Music* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units must be in the same language); music, 2 units. Five elective units are required to make up the total of 15 units.

Students who can meet the prescriptions for any one of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

Admission to courses which give university credit, as *special students, not candidates for a degree,* may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

A student who transfers from another college or university must present a letter of honorable dismissal, and transcript of record, from the institution previously attended.

Registration

Students will present themselves for registration on Monday, June 18. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first secure their study-lists at the Registrar's office, 156 Administration Building.

Fees

All fees are due upon registration.

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. It also entitles one to one lesson per week of music of collegiate grade. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken.

Fees in addition to the tuition fee are required for special work in music, except as just noted. These are comparable with the fees charged for similar work in regular semesters:

Two lessons per week in piano, voice, or in organ of collegiate grade	$12.00
One lesson per week in piano or voice of preparatory grade	5.00
Two lessons per week in piano or voice of preparatory grade	8.00
Use of piano for one hour per day for two months	1.50
Use of organ for one hour per day for two months	10.00
Use of organ for one-half hour per day for two months	5.00

Scholarships

By a ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University,

one must satisfy in full the entrance requirements for some one of the colleges as outlined on page 9.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class of 1917, and to persons (otherwise qualified) who have not been teachers the past year but who are under contract to teach in the state during the coming year.

A person who wishes to take advantage of the scholarship privilege should present to the Registrar prior to June 1, 1917, a statement from the board of education employing him, to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1917) must present either a diploma or a written statement from the president of the normal school certifying that he is a graduate of this year's class.

Application blanks for scholarships may be obtained by addressing the Registrar.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted, unless otherwise specified, towards the degree of Bachelor of Arts or Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should consult the Annual Register of the University under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the dean or assistant dean of the college of his choice—

For the College of Liberal Arts and Sciences—Dean Babcock, Room 304, University Hall.

For the College of Commerce and Business Administration—Acting Dean Weston, Room 104, Commerce Building.

For the College of Engineering—Assistant Dean Miller, Room 300, Engineering Building.

For the College of Agriculture—Assistant Professor Rankin, Room 100, Agricultural Building.

General Assembly

On the first Thursday of the Session, at 4 p. m., an Assembly will be held in Room 218, University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which give an atmosphere differing but little from that of the other sessions of the year: receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

Through the courtesy of the Carnegie Endowment for International Peace, Dr. Edwin D. Dickinson, Assistant Professor of Political Science in Dartmouth College, will deliver a series of lectures on International Relations, extending through the entire eight weeks of the Summer Session.

The song services, which proved so successful during recent Sessions, will be continued, under the direction of Director J. L. Erb of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps each Wednesday evening, 6:45 (except in the first and last weeks).

Director Erb will give a series of six organ recitals during the summer.

Preparation for State Teachers' Certificates

To teachers who desire to make thoro preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the certificating law, enacted by the General Assembly in 1913, are the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate: Requirements are the same as for the elementary-school certificate, except that the examination includes, in addition, sociology, history of education, and school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate: Examination in common branches.
2. Second-grade elementary-school certificate: Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate: Examination in the common branches, three of the natural sciences, English, algebra, general history and pedagogy.
4. High-school certificate: Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate: Examination in English, educational psychology, history of education, and school administration.
6. Special certificate: Examination in English and principles and methods of teaching.

Examinations for the *State Elementary-School Certificate,* the *State Supervisory Certificate* and the *State High-School Certificate* will be held at the University in July; *provided that at least fifteen applicants notify the State Superintendent prior to June 10, 1917, of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university, either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected.

"The thesis must be filed with the Superintendent of Public Instruction before July 15, 1917."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session Courses are especially adapted to prepare for the professional examinations:

Education S-1a, S-1b, and S-10; Principles and Methods of Teaching.

Education S-4, S-20, and S-21 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S-2; History of Modern Education. (The applicant for the state Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-1a, should prepare for the examination in educational psychology.)

Education S-6; The Principles of High School Education.

Education S-104; Seminary in Educational Administration.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Manual Training

The work in manual training will be under the direction of Associate Professor Ira S. Griffith of the University of Missouri. He will be assisted by Mr. James Duncan of the University of Illinois. In addition to the general course in woodworking and manual training for teachers in high schools, a course in the elements of construction will be offered.

The demand for well-qualified teachers of manual training is becoming more and more insistent each year, and the University is not now able to supply even a small fraction of the teachers of manual training that are called for by the schools of the State. The summer work is particularly important since it is planned especially to meet the needs of teachers of manual training in the elementary and high schools.

Field Geology

In order to afford students who are specializing in geology an opportunity for the indispensable field experience, the department this year offers a field course in the Rocky Mountains. For variety of phenomena, ease of access, and favorable conditions for work, a

district between the head of Chugwater Creek and Laramie Peak, in the Laramie range of eastern Wyoming, has been chosen. In this region rocks of Archean, Paleozoic, Mesozoic, and early Tertiary age are well exposed; there are ore intrusions, ore deposits, simple and complex structures, and varied topography. The variety of geologic problems is relatively large and the conditions for field work almost ideal. Professor Blackwelder will be in charge.

Men who have studied geology for one year in college may join the party, up to the limit of eight, if their applications are approved in advance by the instructor in charge. Having secured the instructor's approval, students planning to go on this trip should register for Geology S-41. Eight hours credit will be given on the completion of a satisfactory report prepared after the close of the field season.

The party will leave for the field about June 20 and be ready to return about August 15. While in the field they will live in camp. Each member of the party will supply his own blankets and personal outfit, but the University will furnish tents, general camp equipment, and the more expensive instruments, such as compasses, alidades, and aneroids, and will also pay the wages of the cook or camp tender.

The trip will cost each member of the party between $75.00 and $175.00, all told. This will cover traveling expenses, personal equipment, and each member's share of the cost of the provisions. The average expense incurred will probably be about $125.00.

On account of the small size and close personal supervision of the party, it will be practicable to arrange for field research work by qualified graduate students who may wish to join the expedition. The region affords many interesting geologic problems, some of which are as yet untouched. See Geology S 135, page 34.

After the close of the field work, members of the party who so desire will be favorably situated to visit, on their own initiative, one or more places of great geologic interest, such as the Colorado mining camps and high peaks, Jackson Hole and Yellowstone Park, Great Salt Lake and the Wasatch country, or the Black Hills of South Dakota.

Students from other universities and colleges who are suitably recommended will be welcome. Applications should, if possible, be made before May 10. For additional information address: Professor Eliot Blackwelder, Natural History Building, Urbana, Illinois.

Graduate Work in the Summer Session

During the past two years the Summer Session has placed increasing emphasis upon graduate courses leading to the master's degree. The various departments which are closely related to high school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid upon graduate courses in chemistry, economics, education, English, and mathematics.

The normal requirement for the master's degree is satisfactory work continued during one year of residence. This means a residence of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student by working at the University for one week after each Session under the direction of the professor in charge of his major subject may earn the master's degree in four summers.

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory". Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition, to count the work toward the master's degree.

Summer Courses in Library Training

Beginning Monday, June 18, 1917, and continuing for six weeks, the Library School will conduct a Summer Session *to which will be admitted only high-school graduates actually employed as librarians, or library assistants, or teacher-librarians, or under definite appointment to serve in such positions.* The curriculum will be

planned to meet especially the needs of workers in public libraries and in high-school libraries of Illinois, and no tuition fee will be charged students entering from this state; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No university credit is given for the work.

The work will occupy the whole time of the student. The number of lectures in each subject will be approximately as follows: Cataloging, 20; classification and book numbers, 13; book selection, 14; administration of small libraries, 10; reference work, 10; work with the children, 10; loan system, order, accession and shelf work, binding and repair, 13.

For further information address the Director of the University of Illinois Library School, Urbana, Illinois.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Training for men, to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. They were designed to assist both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation. The class registrations were: in 1914, 254; in 1915, 669; and in 1916, 690.

The courses will again be a feature of the Summer Session, occupying the first six weeks. All the courses will be taught by the men who coach the athletic teams of the University of Illinois: in baseball (Director Huff), track athletics (Mr. Harry Gill), basketball (Mr. Ralph Jones), and football (Mr. Robert Zuppke). The athletic plant of the University is turned into a laboratory and the larger part of the instruction is given on Illinois Field.

Mr. Fargo, Director of the Gymnasium, University of Illinois, will offer courses in gymnastics.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Ill.

Explanation of Abbreviations, Etc.

"S," which is prefixed to each of the courses offered, means "summer" and is used to distinguish such courses from those of the same number offered during the regular university year. Summer courses do not always cover the same ground as those similarly numbered in the regular session; their equivalency is usually stated.

The number of credit hours (usually called semester hours) that may be earned in any course is clearly indicated in every case.

Courses numbered 100 and above carry graduate credit and are open only to graduate students.

The following abbreviations are used to designate the different buildings in which classes are held:

Adm. ..... Administration Building
Agr. ..... College of Agriculture
Chem. Lab. ..... Chemical Laboratory
Com. ..... Commerce Building
E.H. ..... Engineering Hall
Farm Mech. ..... Farm Mechanics Building
App. Mech. Lab. ..... Laboratory of Applied Mechanics
Law ..... Law Building
L.H. ..... Lincoln Hall
Physics Lab. ..... Physics Laboratory
N.H. ..... Natural History Building
Stock Pav. ..... Stock Pavilion
Trans. ..... Transportation Building
U.H. ..... University Hall
Viv. ..... Vivarium Building
W.B. ..... Woman's Building

OUTLINE OF COURSES

ACCOUNTANCY

(See Business Organization and Operation)

AGRICULTURE AND AGRICULTURAL EXTENSION

(See Agronomy, Animal Husbandry, Dairy Husbandry and Horticulture)

Assistant Professor NOLAN, in charge of courses given by the College of Agriculture

S 1. GENERAL AGRICULTURE.—Agronomy, animal husbandry, horticulture, and farm business. Selection of subject-matter, and methods of presentation for elementary and secondary schools. M. T.W.T.F., 10; 553 Agr.; 2½ credit hours.

Assistant Professor NOLAN

S 90. RURAL EDUCATION.—Rural life conditions, needs, and agencies at work in rural progress. T.W.T.F., 11; 553 Agr.; 2 credit hours. Assistant Professor NOLAN

AGRONOMY

Associate Professor STEWART, Assistant Professor WHITE, Mr. WALWORTH

S 23. PLANT FOOD SUPPLIES.—The world's supply of plant-food materials; American resources; utilization of the nitrogen resources of the soil, atmosphere, and by-products; utilization and conservation of the natural deposits of potassium, phosphorus, calcium, and magnesium and of by-products containing these plant foods. M. T.W.T., 8; 302 Agr.; 2 credit hours.

Associate Professor STEWART

Prerequisite: Agronomy 12.

Equivalent: Double value, Agronomy 23.

S 25. FARM CROPS.—Plant growth; structure; production and harvesting; habits, characteristics, requirements, means of improvement; common diseases, insects, and their control; weeds and seed identification; weed control; seed testing; market grades of grain; grain judging. Lectures, laboratory, and field work. M.T.W.T., 10, 11; 600 Agr.; 2 credit hours. Mr. WALWORTH

Equivalent: One-half of Agronomy 25.

S 26. ELEMENTARY FARM MECHANICS.—Ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm

water systems, lighting systems, heating systems, power transmission, elementary mechanics, and equalizers. Design of farm power plant. M.T.W.T.F., 3, 4; 205 Farm Mech.; 2½ credit hours.

Assistant Professor WHITE

Equivalent: Agronomy 26.

ANIMAL HUSBANDRY

Mr. BARTO, Mr. GUSLER, Mr. ROBERTS

S 5. FUNDAMENTALS OF LIVE STOCK JUDGING.—Names and locations of external parts of the kinds of live stock; the use of the score card; comparative judging; breed identification; types of farm animals. M.T.W., 8; T.F., 8, 9; Stock Pav.; 2½ credit hours.

Mr. GUSLER

Equivalent: Animal Husbandry 5.

S 8. PRINCIPLES OF BREEDING.—Heredity and variation; evolution, reproduction, transmission of characters, causes of variation, relative effects of heredity and environment, methods of plant and animal improvement. M.T.W.T., 11; 107 Genetics; 2 credit hours.

Mr. ROBERTS

Equivalent: Double value, Animal Husbandry 8.

S 22. ADVANCED STOCK JUDGING.—Animal conformation, quality, and condition with reference to market and show yard requirements; selection for feed lot, market, and exhibition; judging at live stock shows. (Three days will be spent in visiting breeders in northern Illinois and southern Wisconsin, and in a visit to the University of Wisconsin, if deemed practical by those in charge of the class. The cost of this trip, if taken, will be about $25.) M.T.W.T., F., 10; Stock Pav.; 1½ credit hours.

Mr. GUSLER

Prerequisites: Animal Husbandry 1a, 2a, 4a, 11a, or their equivalents.

Equivalent: One-half Animal Husbandry 22.

S 23. POULTRY TYPES, BREEDS AND VARIETIES.—Exhibiting and judging; breeding; poultry houses and equipment; feeding, hatching, and brooding; market eggs and poultry; diseases and their treatment. M.T.W.T.F., 8; Stock Pav.; 2½ credit hours.

Mr. BARTO

Prerequisites: Animal Husbandry 5, or its equivalent.

Equivalent: One-half Animal Husbandry 23.

ART AND DESIGN

Assistant Professor LAKE

S 1. ELEMENTARY.—Form drawing from still-life, cast, and nature; outline and shading in pencil, charcoal, and crayon; lectures on the principles of perspective. M.T.W.T.F., 1, 2,; 405 U.H.; 2 or 3 credit hours. Assistant Professor LAKE

Equivalent with 3 hours credit to Art and Design 1.

S 12. DESIGN.—Theory and practise; theory of pure design and the effect of material on execution; fitness of different forms of media for different sorts of design; space division and space relations; color; color schemes and exercises; conventionalization of natural forms for various functions; execution. M.T.W.T.F., 3; 402 U.H.; 2 credit hours. Assistant Professor LAKE

Equivalent: Art and Design 12.

S 20. HISTORY OF THE FINE ARTS.—Periods and styles of architecture, sculpture and painting during the Italian Renaissance and up to the present time. M.T.W.T., 4; 410 U.H.; 2 credit hours.

Equivalent: Art and Design, 20. Assistant Professor LAKE

BOTANY

Professor HOTTES, Dr. MCDOUGALL

S 4. THE LOCAL FLORA.—Morphology, identification, and classification of wild plants. Laboratory; field work. (For students desiring acquaintance with the plants of Illinois, and for teachers in the public schools.) T.W.T.F., 9-12; 216 N.H.; 3 credit hours.

Dr. MCDOUGALL

Prerequisite: Entrance Botany or its equivalent.

Equivalent: Botany 4.

S 23. PLANT ECOLOGY.—The life of plants in their natural habitats, in relation to environment, to animals, and to each other. Lecture-quiz, T.T., 3; 229 N.H., laboratory or field, M.W., 1-5; 216 N.H.; 3 credit hours. Dr. MCDOUGALL

Prerequisite: Botany 1 or its equivalent.

Equivalent: Botany 23.

S 27a. PLANT PHYSIOLOGY.—The absorption of materials from the external world and their transformation within the organism; the production and use of food; processes fundamental to agriculture—crop production. Lecture-quiz, M.W.F., 10; Laboratory M. W.F.; 8-10, 11; 308 N.H.; 4 credit hours. Professor HOTTES

Prerequisite: Botany 1 or its equivalent.

Equivalent: Botany 27a, in part.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 9b. PLANT PHYSIOLOGY.—Problems for those specializing in plant physiology, or its application to plant breeding or crop production. Arrange time; 104 Botany Annex; 3-5 credit hours.

Professor HOTTES

Prerequisite: 10 hours of Botany including 27a or its equivalent; junior standing.

Equivalent: Botany 9b.

S 25. PLANT ECOLOGY.—Advanced studies in the ecology of plants or of plant communities. Arrange time; 304 N.H.; 3 to 5 credit hours. Dr. MCDOUGALL

Prerequisite: 10 hours of botany including botany 23, or its equivalent; junior standing.

Equivalent: Botany 25a or 25b.

COURSE FOR GRADUATES

S 102. PHYSIOLOGY.—The effects of external stimuli on growth and movement. Special subjects for investigation are assigned on consultation. Reports and discussions of current literature and research results. Arrange time; 104 Botany Annex; 3 to 5 credit hours. Professor HOTTES

BUSINESS ORGANIZATION AND OPERATION

Mr. SCOVILL, Dr. BRITTON

A. *ACCOUNTANCY*

S 1a. PRINCIPLES OF ACCOUNTING.—Accounting and bookkeeping. Accounting procedure. T.W.T.F., 8, 9, 10; 303 Com; 3 credit hours. Mr. SCOVILL

Equivalent: Accountancy 1a.

S 15. TEACHERS' COURSE IN ACCOUNTING.—Methods of approach in teaching. Theoretical points dealing with adjustments, reserves, depreciation, goodwill, system-building and other principles. Primarily for high school teachers; others admitted by consent of instructor. M.T.W.T.F., 11; 206 Com; 2 credit hours.

Mr. SCOVILL

Prerequisite: One year of high school bookkeeping or its equivalent.

B. *BUSINESS ORGANIZATION AND OPERATION*

S 1. BUSINESS ORGANIZATION AND OPERATION.—Forms of business organization, partnerships, joint stock companies, corporations, trusts, pools and combinations; problems in regulation and control;

rights and liabilities of members and officers, rights of creditors; business and legal problems in the internal organization and conduct of business. (Not accepted for credit for students in the College of Commerce and Business Administration.) M.T.W.T.F., 10; 206 Com.; 2 credit hours. Dr. Britton

C. *BUSINESS LAW*

S 1. Commercial Law.—Contracts; agency; sales; negotiable instruments; cases; readings and lectures. (This course is not accepted for credit for students in the College of Commerce and Business Administration.) M.T.W.T.F., 8; 206 Com; 2 credit hours. Dr. Britton

CHEMISTRY

Assistant Professor Adams, Dr. Beal, Dr. Hopkins, Dr. Lewis, Dr. Sears, Dr. Ball, Dr. Kamm, Dr. Anderegg, Mr. Karr, Mr. Howell, Mr. Kremers, Miss Sparks

Note: All of the courses in chemistry offered in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

S 1. Elementary Chemistry.—The non-metallic elements. Text: Noyes' *Text Book of Chemistry.* Lecture—quiz, M.T.W.T.F.S,. 11; Laboratory, M.T.W.T.F.S., 8, 9 or 9, 10; Chem. Lab.; 5 credit hours. Dr. Hopkins, Dr. Anderegg, Mr. Kremers

S 1a. Inorganic Chemistry.—For students who have had one year of high-school chemistry. This course may be taken at the same hours as chemistry S 1, but only four hours of laboratory work are required. Chem. Lab.; 3 credit hours.
Dr. Hopkins, Dr. Anderegg, Mr. Kremers

S 1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S 1, but only six hours of laboratory work are required. Chem. Lab; 4 credit
Dr. Hopkins, Mr. Kremers

S 2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Text Book of Chemistry,* Noyes and Smith's *Qualitative Analysis.* Lectures, M.T.W.T., 9; Quiz, M.T.W.T., 8; Laboratory, M.T.W.T.F.S., 10, 11; Chem. Lab.; 5 credit hours. Dr. Sears, Dr. Anderegg

Prerequisite: Chemistry 1 or 1a.

S 3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes

Text Book of Chemistry, Noyes' and Smith's *Qualitative Analysis.* Arrange; Chem. Lab.; 6 credit hours. Dr. SEARS, Dr. ANDEREGG

Prerequisite: Chemistry 1.

S 5a. ELEMENTARY QUANTITATIVE ANALYSIS.—Gravimetric and volumetric methods; stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis.* Lecture or quiz, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12. F., 8-12. 260 Chem. Lab.; 5 credit hours. Dr. BEAL, Dr. BALL

Prerequisite: Chemistry 2a or 3a.

S 13a. AGRICULTURAL ANALYSIS.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5a. Talbot's *Quantitative Chemical Analysis.* (For students in agriculture and household science) Lecture or Quiz, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12, F., 8-12; 260 Chem. Lab.; 5 credit hours. Dr. BEAL, Dr. BALL

Prerequisite: Chemistry 2a or 3a.

S 17. TEACHERS' COURSE.—Methods of teaching elementary chemistry. T.T., 10; Chem. Lab.; 1 credit hour.

Dr. HOPKINS

Prerequisite: One year's work in chemistry.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 9a. ORGANIC CHEMISTRY (elementary laboratory work).—Typical laboratory methods; syntheses of some of the more important organic compounds. M.T.W.T.F., 9-12; Chem. Lab.; 2 credit hours. Assistant Professor ADAMS, Dr. KAMM

Prerequisite: Registration in Chemistry S 14a or completion of a course equivalent to S 14a.

S 9b. ORGANIC CHEMISTRY (advanced laboratory work).—Preparations in organic chemistry and quantitative organic analysis. M.T.W.T.F., 9-12; Chem. Lab.; 2 credit hours.

Assistant Professor ADAMS, Dr. KAMM

Prerequisite: Registration in Chemistry S 14b or completion of a course equivalent to S 14b.

S 14a. ELEMENTARY ORGANIC CHEMISTRY.—Derivatives of carbon. M.T.W.T.F., 8; Chem. Lab.; 3 credit hours.

Assistant Professor ADAMS, Dr. KAMM

Prerequisite: Chemistry S 2a or S 3a or equivalent courses.

S 14b. Organic Chemistry (second course).—Continuation of Chemistry S 14a. Five hours a week. Arrange; Chem. Lab.; 3 credit hours. Assistant Professor Adams, Dr. Kamm

Prerequisite: Chemistry S 14a and S 9a or equivalent courses.

S 15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile putrefaction products; feces; blood, milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these topics treated thoroughly for the prospective student of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews' *Physiological Chemistry;* Hawk's *Practical Physiological Chemistry.* M.T.W.T.F., 8-12; 450 Chem. Lab.; 5 credit hours.

Dr. Lewis, Mr. Karr

Prerequisite: Chemistry 5a or 13a, and 14a-b or 9 and 9c, or equivalent.

S 25 (formerly S 5c). Food Analysis.—Quantitative organic analysis; examination of food and drug products: alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis* and Sherman's *Food Products, "Bulletin 107, rev., U. S. Bureau of Chemistry."* Lecture, M.T.W.T.F., 11; Laboratory, M.T.W.T.F., 8-11; Chem. Lab.; 5 credit hours. Dr. Beal, Dr. Ball

S 11 and S 111.—Research.—Advanced work and research in inorganic, organic, analytical, or physiological chemistry. Arrange.

Assistant Professor Adams, Dr. Beal, Dr. Lewis, Dr. Hopkins

(Subject to approval of Graduate School Faculty.)

S 92. History of Chemistry.—Periods, theories, leaders; use of literature. Lectures, reports, reference work. Two periods a week; 1 credit hour. Miss Sparks

THE CLASSICS

LATIN

Professor Barton, Professor Smiley

S 1. Terence.—Reading of three plays; discussion of the language and verse of Roman comedy. M.T.W.T.F., 3; 114 L.H.; 2½ credit hours. Professor Smiley

Prerequisite: Three or four years of high-school Latin.

S 2. VERGIL.—Selections from the Aeneid; scansion; technique. M.T.W.T.F., 3; 120 L.H.; 2½ credit hours. Professor BARTON

Prerequisite: Two or three years of high-school Latin.

S 3. HORACE.—Selections from the Odes. M.W.F., 1; 114 L. H.; 1½ credit hours. Professor SMILEY

Prerequisite: One year of college Latin.

S 4. TEACHERS' COURSE.—Purpose, problems and methods of secondary instruction in Latin; books and equipment. M.W.F., 2; 120 L.H.; 1½ credit hours. Professor BARTON

S 5. ROMAN PRIVATE LIFE.—The family; the organization of society; marriage; education; dress. T.T., 2; 120 L.H.; 1 credit hour. Professor BARTON

COURSE FOR UNDERGRADUATES AND GRADUATES

S 16. LUCRETIUS.—The first, third, and fifth books; ancient philosophy, with particular attention to Roman stoicism; dactylic hexameter verse form. Twice a week; 2 credit hours or ½ unit. Arrange time. Professor SMILEY

Prerequisite: Fifteen hours of college Latin.

COMMERCIAL LAW

(See Business Organization and Operation.)

DAIRY HUSBANDRY

Mr. ALLEN

S 6. GERM LIFE AND THE DAIRY.—The general relations of bacteriology to dairy problems. Lectures; assigned readings. W.F., 2; 454 Agr.; 1 credit hour. Mr. ALLEN

Equivalent: Dairy Husbandry 6.

ECONOMICS

(See also Business Organization and Operation)

Assistant Professor C. M. THOMPSON, Dr. STEWART, Dr. RUSSELL

S 2. PRINCIPLES OF ECONOMICS.—M.T.W.T.F.S., 8; 101 Com.; 3 credit hours. Assistant Professor THOMPSON

Prerequisite: One year of university work or (for teachers) the permission of the instructor.

Equivalent: Economics 2.

S 3. Money and Banking.—M.T.W.T.F., 10; 111 Com.; 2½ credit hours. Dr. Russell

Prerequisite: A 5-hour course in the principles of economics or the permission of the instructor.

Equivalent: To Economics 3 when used as a prerequisite.

S 7. Economic History of England.—M.T.W.T.F., 11; 111 Com.; 2½ credit hours. Dr. Russell

S 16c. Agricultural Economics.—The economic principles underlying the farming industry and the conditions of rural life. M. T.W.T.F.S., 9; 307 Com.; 3 credit hours. Dr. Stewart

Prerequisite: Economics 1 or 2 or (for teachers) the permission of the instructor.

Equivalent: Economics 16c.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 14. Agricultural Cooperation.—The organization, financing, and management of cooperative associations for the promotion of farming. M.T.W.T., 10; 307 Com.; 2 credit hours; ½ graduate unit. Dr. Stewart

Prerequisite: Economics 1 or 2; and the permission of the instructor.

Equivalent: Economics 14.

S 61. Economic Theory.—M.T.W.T., 9; 101 Com.; 2 credit hours; ½ graduate unit. Assistant Professor Thompson

Prerequisite: A 5-hour course in the principles of economics, and the permission of the instructor.

EDUCATION AND PSYCHOLOGY

Professors Johnston, Hollister, Anderson, and Rhoton, Mr. Stevenson, Mr. O'Gorman, Miss Berninger, Mr. Layton, Mr. Newlon

Note: The prerequisites as stated in connection with the following courses may, in the discretion of the head of the department and the instructor in charge of each course, be modified in their application to teachers who may desire to enroll in the courses in question.

COURSES FOR UNDERGRADUATES

S 1a. Principles of Education.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; the

problem of educational values. M.T.W.T.F.S., 8; 206 U.H.; 3 credit hours. Mr. Stevenson

Prerequisite: Junior standing.

Equivalent: With Education S 1b, this course is equivalent to Education 1 as offered during the university year. Education 1 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S 1b. The Educational System.—The school system of the United States, its present organization, its origin, its distinctive characteristics as compared with other systems, its present problems. Lectures and readings. M.T., 2; 206 U.H.; 1 credit hour.

Mr. Layton

Prerequisite: Junior standing.

Equivalent: With Education S 1a, this course is equivalent to Education 1.

S 2. History of Modern Education.—The development of educational theory and practise from the Renaissance. Text: Duggan: *A student's text-book in the history of education.* M.T. W.T.F., 1; 113 L.H.; 2½ credit hours. Professor Rhoton

Prerequisite: Junior standing.

Equivalent: Education 2 (in part).

S 10. The Technic of Teaching.—Types of classroom exercises and the preparation of teaching plans; hygiene; classroom management; professional ethics. (Required, by Senate ruling, of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.) Section A, M.T.W.T.F.S., 8; Section B, M.T.W.T.F.S., 2; 211 U.H.; 3 credit hours. Professor Hollister, Miss Berninger

Prerequisite: Education 1.

Equivalent: Education 10.

S 25. Educational Psychology.—Mental activity with special reference to educational problems. Mental heredity, instinct, habit and learning, attention and interest, association, the training of observation, memory, and reasoning. Texts: Whipple's *Questions in Psychology,* and Colvin and Bagley's *Human Behavoir.* M.T.W.T.F.S., 9; 417 U.H.; 3 credit hours. Mr. O'Gorman

Prerequisite: Junior standing.

Equivalent: Education 25 (in part).

COURSES FOR GRADUATES AND UNDERGRADUATES

S 4. School Organization and Administration.—The establishment of schools and provisions for their administration; units of control; maintenance; training and selection of teachers. T.W.T.F., 3; 202 L.H.; 2 credit hours. Professor Anderson

Prerequisite: Education 1 or equivalent.

Equivalent: Education 4 (in part).

S 5. Comparative Education.—Elementary and secondary schools of the principal foreign countries. T.W.T.F., 8; 113 L.H.; 2 credit hours. Professor Anderson

S 6. The Principles of High-School Education.—The evolution of high schools and of secondary education; high schools and the state system; legal status; articulation with elementary school, college, technical schools, community and home; teaching staff; reorganization of curriculums; "controls" of construction; student activities; vocational and moral guidance; school journalism; debating activities; athletics; high-school hygiene. M.T.W.T., 10; 202 L.H.; 2 credit hours. Professor Johnson, Mr. Newlon

Prerequisite: Education 1, or equivalent.

Equivalent: Education 6 (in part).

S 18. Method in Educational Research.—Statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees). W.T.F., 2; 113 L.H.; 1½ credit hours. Professor ———

Prerequisite: Education 1.

Equivalent: Education 18.

S 20. Supervision.—Limitations, types, functions, standards and devices of supervisors; subject limits and time limits of the course of study; adaptation of the materials of the course of study to types of mind; rating of teachers; improvement of teachers in service; technic of criticism. Lectures, readings and investigations of special problems. M.T.W.T., 9; 207 U.H.; 2 credit hours. Professor Hollister

Prerequisite: Education 1 or equivalent.

Equivalent: Education 20 (in part).

S 21. Units, Scales, and Standards.—Units, scales, and standards for measuring educational achievement or determining progress in arithmetic, spelling, handwriting, reading, composition, drawing, history, and geography. Lectures, readings, and the investigation of some special problem in educational measurement. M.T.W.T., 10; 206 U.H.; 2 credit hours. Professor ———

Prerequisite: Education 1 or equivalent.

S 22. School Surveys.—A study of reports of typical school surveys with special reference to the methods employed. Surveying small school systems. M.W., 10-12; 103 L.H.; 2 credit hours.
Mr. Stevenson

Prerequisite: Education 1 and 4 or equivalents.

S 43. Mental Tests.—Technic of mental tests, including tests of sensory capacities; attention; memory; learning; suggestibility; inventiveness; diagnosis of mental age; general intellectual status; mental retardation; etc. Text: Whipple's *Manual of Mental and Physical Tests.* T.T., 10-12; 417 U.H.; 1 credit hour.
Professor ———

Prerequisite: Education 25 or equivalent and the consent of the instructor.

S 32. Moral Education.—Moral education; aims and methods; relations between church and school. T.W.T.F., 11; 2 credit hours. Mr. O'Gorman

Prerequisite: Education 1 or its equivalent.

COURSES FOR GRADUATES ONLY

S 104. Seminar in School Administration.—Problems in the standardization of schools. M., 4-6; 103 L.H.; ½ graduate unit.
Professor Hollister

Prerequisite: Graduate standing, with preliminary courses satisfactory to the instructor.

S 105. Seminar in Comparative Education.—W., 4-6; 103 L.H.; (Subject to the approval of the Executive Faculty of the Graduate School). Professor Anderson

S 127. Junior and Senior High-School Curriculums.—Curriculum organization and special methods in junior and senior high schools; comparisons with foreign secondary school systems. Th., 4-6, (and arrange weekly individual conference with instructors); 103 L.H.; 1 graduate unit. Professor Johnston, Mr. Newlon

Prerequisite: Graduate standing, with preliminary courses in Education satisfactory to the instructor.

ENGLISH

A. LANGUAGE AND LITERATURE

Professor Dodge, Professor Pattee, Professor Crawford, Associate Professor Paul, Assistant Professor Jones, Mr. Weirick, Mr. Tieje

S 2a. Survey of English Literature.—First half of the nine-

teenth century. M.T.T.F., 9; 307 U.H.; 2 credit hours. Mr. Weirick

Prerequisite: One year of college work or the equivalent.

Equivalent: First half of English 2. (Together with S 2b this course covers the work of English 2. To be credited as equivalent to English 2, S 2a and S 2b should be taken simultaneously).

S 2b. Survey of English Literature.—English literature from 1850 to 1892. (A continuation of English S 2a, and the two must be taken simultaneously.) M.T.T.F., 11; 307 U.H.; 2 credit hours. Mr. Tieje

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 2 (See note under S 2a).

S 12. American Literature.—Bryant, Irving, Cooper, Hawthorne, Emerson, Poe, Longfellow, Whittier, Lowell. Lectures, discussions, readings, and reports. Text: Page's *Chief American Poets*. T.W.T.F., 1; 202 L.H., 2 credit hours.

Associate Professor Paul

Prerequisite: One year of college English or the equivalent.

Equivalent: English 12.

S 23. Shakespeare.—Two Gentlemen of Verona, Midsummer Night's Dream, Richard III, Romeo and Juliet, Much Ado, Twelfth Night, Othello, Lear, Winter's Tale, Tempest. Text: *The Arden Shakespeare*. M.T.W.T.F., 3; 315 U.H.; 2½ credit hours.

Assistant Professor Jones

Prerequisite: One year of college English or an equivalent.

Equivalent: English 23 (in part).

S 41. English for Teachers.—Outlining courses in English; classics used in high schools; correcting and grading compositions; library equipment; problems in the teaching of English. Lectures, discussions, and reports. M.W.F., 2; 202 L.H.; 1½ credit hours.

Associate Professor Paul

Prerequisite: Sixteen hours of English literature. Open to any upperclassman with the consent of the instructor. (Not credited toward advanced degrees, or toward a major in English).

Equivalent: English 41 (in part).

COURSES FOR UNDERGRADUATES AND GRADUATES

S 8. Old English (Anglo-Saxon).—Grammar, with specimens of prose. Text: Bright's *Anglo-Saxon*. M.T.W.T.F.S., 9; 110 L.H.; 3 credit hours or ¼ unit. Professor Dodge

Prerequisite: Two years of college English.

Equivalent: English 8.

S 25. CHAUCER.—Selections from the *Canterbury Tales.* Text: Skeat's *Students' Chaucer.* M.T.W.T.F., 8; 218 L.H.; 2½ credit hours. Assistant Professor JONES

Prerequisite: Two years of college work or equivalent.

Equivalent: English 25 (in part).

S 45. CONTEMPORARY EUROPEAN DRAMA.—The "theatre of ideas," Teutonic naturalism, and the peasant drama of England and Ireland. Modern stagecraft. Ibsen, Strindberg, Hauptmann, Schnitzler, Hofmannstahl, Zola, Becque, Brieux, Hervieu, Maeterlinck, Shaw, Galsworthy, Masefield, Barker, Synge, Fitch, Moody, and others. M.T.W.T.F.S., 11; 110 L.H.; 3 credit hours. (Attention of those who register in this course is called to Public Speaking S 10.) Professor DODGE

Prerequisite: Sixteen hours of English literature. Open to any upperclassman or graduate student with the consent of the instructor.

Equivalent: English 45.

S 55. ENGLISH LITERATURE OF THE NINETEENTH CENTURY.—The evolution of the England of today from the England of the eighteenth century. M.T.W.T.F., 9; 218 L.H.; 2½ credit hours. Professor PATTEE

Prerequisite: Sixteen hours of English literature. Open to any upperclassman with the consent of the instructor.

COURSES FOR GRADUATES ONLY

S 101. RESEARCH IN SPECIAL PERIODS.—Individual conferences arranged with graduate students engaged upon definite pieces of investigation.

Professors DODGE and PATTEE, Associate Professor PAUL, Assistant Professor JONES

S 135. THE NATIONAL PERIOD IN AMERICAN LITERATURE.—American life and letters since the war between the states. M.T.W.T.F., 10; 218 L.H.; one unit. Professor PATTEE

Equivalent: English 135 (in part).

S 136. THE RISE OF NEO-CLASSICISM.—The literary relations of France and England at the end of the seventeenth century. Lectures, readings, theses. M.T.W.T.F., 3; 110 L.H.; one unit. Associate Professor PAUL

Equivalent: First semester of English 136.

B. RHETORIC

Mr. Weirick, Mr. Tieje, Mr. ———

S 1. Rhetoric and Themes.—Principles of structure; grammar; punctuation; the sentence; reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: *Handbook of Composition* and Scott and Denney's *Paragraph Writing.* M.T.W.T.F.S., *two sections:* A at 8, B at 9; 309 U.H.; 3 credit hours. Mr. ———

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S 2. Rhetoric and Themes.—Principles of argumentation, narration, and description. Text: Scott and Zeitlin, *College Readings.* M.T.W.T.F.S., 10; 308 U.H.; 3 credit hours. Mr. Tieje

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

S 17. Advanced Composition.—Structure; criticism of current periodical literature; development of material for magazines. (Open to a limited number of students, and only on approval.) M.T.W.T.F.S., 10; 218 L.H.; 3 credit hours. Mr. Weirick

C. PUBLIC SPEAKING

Professor Crawford

S 1. Oral Expression.—Vocal methods, relation of the voice to the interpretation of thought. M.T.T.F., 8; 318 U.H.; 2 credit hours. Professor Crawford

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(Credit is not given for this course unless it is followed by Public Speaking 2, 10, or their equivalents.)

S 10. Interpretation and Dramatization.—Oral reading of types of literature; principles of stage action; staging and acting of several one-act plays. (Attention of those who register in this course is called to English S 45.) M.T.T.F., 9; 318 U.H.; 2 credit hours. Professor Crawford

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S 11. Problems in the Teaching of Oral English.—Primarily for high school teachers. M.W., 10; 318 U.H.; 1 credit hour. Professor Crawford

Prerequisite: The consent of the instructor.

ENTOMOLOGY

Assistant Professor Folsom, Dr. Glasgow

S 1. General Field and Laboratory Course.—Essential facts of entomology; its economic importance. Lectures, laboratory, and field trips. Text: Folsom's *Entomology with Reference to its Biological and Economic Aspects.* T.W.T.F., 1, 2; 405 N.H.; 2 credit hours.

S 3. Economic Entomology.—Stages of development of common injurious insects. Laboratory; field trips. M.T.W.T.F., 1, 2, and two additional hours; 408 N.H.; 3 credit hours.

Equivalent: Entomology 4.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 2. Advanced Course.—Instruction to meet the purposes of the individual student. Arrange; 405 N.H.; 2 or 3 credit hours.

S 4. Advanced Economic Entomology.—Assigned problems in economic entomology, to prepare advanced students for immediate service as state and government entomologists. Arrange; Ent. Building; 3 credit hours.

Prerequisite: 15 hours' credit in general and economic entomology.

Equivalent: Entomology 8.

GEOLOGY

Professor Blackwelder

S 41. Field Geology.—A field course in the Rocky Mountains in Eastern Wyoming. Party limited to eight. See details on page 14. Eight weeks. 8 credit hours. Professor Blackwelder

Prerequisite: One year of geology in college.

COURSE FOR GRADUATES ONLY

S 135. Research in Field.— Professor Blackwelder

GERMAN

Professor Curme, Dr. Koller, Dr. Nordmeyer, Dr. Fernsemer

S 1. Beginners' Course.—M.T.W.T., 10, 11, F. 11; 215 L.H.; 4 credit hours. Text: Gohdes and Buschek's *Sprach-und Lesebuch.* Dr. Koller

Equivalent: German 1.

S 3. Intermediate Course.—Narrative prose. M.T.W.T.F.S., 9; 312 U.H.; 3 credit hours. Dr. Fernsemer

Prerequisite: German 1 or S1.

Equivalent: German 3 (in part).

S 4. Prose Reading.—Narrative prose; sight reading; composition. M.T.W.T.F.S., 8; 312 U.H.; 3 credit hours.

Dr. Nordmeyer

Prerequisite: German 3.

Equivalent: German 4 (in part).

S 16. Composition and Conversation.—M.T.W.T., 10; 312 U.H.; 2 credit hours. Dr. Fernsemer, Dr. Nordmeyer

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 16.

S 24. Modern Drama.—Rapid reading of representative nineteenth-century dramas. M.T.W.T., 8; 215 L.H.; 2 credit hours.

Professor Curme

Prerequisite: German 5 or two years of university German.

Equivalent: German 24.

S 25. Teachers' Course.—Place, aim, and scope of the study of German in the high school; methods; difficulties. Observation work in the beginners' course. T.T., 9; 215 L.H.; 1 credit hour.

Dr. Koller

Prerequisite: Three years of university German or an equivalent.

Equivalent: One-half of German 25.

COURSES FOR UNDERGRADUATES AND GRADUATES

S 11. History of German Literature to the End of the Reformation.—Lectures; recitations; reports on assigned reading. M.T.W.T., 11; 205 L.H.; 2 credit hours. Dr. Nordmeyer

Prerequisite: Three years of university German or an equivalent.

Equivalent: German 11 (in part).

S 14. Elementary Middle High German.—Introduction to the German language and literature of the Middle Ages. M.W.F., 9; 215 L.H.; 1½ credit hours. Professor Curme

Prerequisite: Three years of university German or equivalent.

Equivalent: German 31 (in part).

S 19a. Goethe's Faust.—M.T.W.T., 8; 205 L.H.; 2 credit hours. Dr. Fernsemer

Prerequisite: Three years of university German or an equivalent.

Equivalent: German 19a.

COURSE FOR GRADUATES ONLY

S 125. History of the German Language.—M.W.F., 10; 205 L.H.; 1 unit. Professor Curme

HISTORY

Professor Lybyer, Professor Phillips

S 1c. European History, 1648-1917.—Europe since the Thirty Years' War. M.T.W.T.F., 8; 311 L.H.; 3 credit hours. Professor Lybyer

Equivalent: The final one-third of History 1a-1b.

S 3a. American History, 1606-1783.—The colonial era and the American Revolution. M.T.W.T.F., 10; 305 L.H.; 2½ credit hours. Professor Phillips

Prerequisite: One year of college work or its equivalent.

Equivalent: History 3a (in part).

COURSES FOR UNDERGRADUATES AND GRADUATES

(At least junior standing required.)

S 21. The History of the United States Since the Reconstruction.—Historical introduction to contemporary politics; influence of the far west. M.T.W.T.F., 11; 305 L.H.; 2½ credit hours. Professor Phillips

Prerequisite: One college course in American history or its equivalent.

Equivalent: History 21 (in part).

S 30b. The Ottoman Empire and the Near East Since 1683.—The Balkan and Near Eastern problems since 1908. M.T.T.F., 9; 311 L.H.; 2 credit hours. Professor Lybyer

Prerequisite: One college course in European history or its equivalent.

Equivalent: History 30.

COURSES FOR GRADUATES ONLY

S 101. Seminar in American History.—Discussion of selected problems and guidance in the investigation of special topics. Time and credit to be arranged. Professor Phillips and others.

S 104. Seminar in European History.—Personal conferences with graduate students who desire guidance in research, with one joint meeting each week for studies in method and critical problems. Time and credit to be arranged. Professor Lybyer

HORTICULTURE

(Including Landscape Gardening)

Assistant Professor PICKETT, and Mr. NICOLET

S 1a. ELEMENTS OF HORTICULTURE.—The farm home; orcharding; orchard insects and diseases with methods of control. M.T.W.T., 1, 2; 302 Agr.; 2 credit hours.

Assistant Professor PICKETT

Equivalent: Horticulture 1a.

S 1b. ELEMENTS OF HORTICULTURE.—The farm home; vegetable gardening; storage of vegetables and fruit for winter; essentials of ornamental planting. T.W.T.F., 3, 4; 302 Agr.; 2 credit hours.

Assistant Professor PICKETT

Equivalent: Horticulture 1b.

S 10a. LANDSCAPE GARDENING.—Landscape gardening as applied to home surroundings, school grounds, parks, and public building sites. Lectures and laboratory work. M.W., 9; T.Th., 9, 10; 306 Agr.; 2 credit hours. Mr. NICOLET

HOUSEHOLD SCIENCE

Miss PARSONS, Miss HOPE, Miss MACKINNON, Miss BROOKS, Miss LAMOREAUX, Miss CARTER

Foods.—The work offered in foods is of two grades: (a), that designed for those who have studied or taught household science and wish to prepare themselves to teach it in high school; (b), advanced work dealing with the general subject of nutrition.

S 1. FOODS.—Sources and cost; cooking of various types; planning and service of meals. Text: Bevier and VanMeter's *Selection and Preparation of Food;* Bailey's *Source, Chemistry and Use of Food.* Laboratory, M.W.F., 10, 11; Lecture, Tu., 10; Quiz, Th., 10; W.B.; 2 credit hours. Laboratory fee, $2.00.

Miss MACKINNON, Miss CARTER

S 2. FOODS (Advanced Course).—Relative nutritive values; dietetic values; relation of foods to the human body. Text: Rose's *Feeding the Family.* Laboratory, T.,Th., 8, 9; Lecture, M., 8; Quiz, W.F., 8; W.B.; 2 credit hours. Laboratory fee, $2.00.

Miss MACKINNON, Miss CARTER

Prerequisite: A year's work of college rank with foods; a year of general chemistry; a course in general physiology.

Equivalent: Household Science 1 (in part).

S 4. Clothing.—Textiles used in clothing; cost and care of clothing; use of patterns; drafting; the making of clothing. Lecture and discussion. M. 2; Laboratory and demonstration, W.F., 1, 2, 3; W.B.; 2 credit hours. Miss Lamoreaux

Equivalent: Two-thirds of Household Science 12.

S 5. Millinery.—Design and construction of wire, buckram, and cape net frames; covering with velvet and straw. Demonstrations and laboratory. T. Th., 1, 2, 3; W.B.; 1½ credit hours. Miss Lamoreaux

S 6a. Costume Design.—Appropriate dress; proportion of parts; outline of figure, and color harmony. M.W.F., 10, 11; W.B.; 1½ credit hours. Miss Hope

Equivalent: One-half of Household Science 19. The department plans to give to those having the prerequisites the two halves of Course 19 in alternate Summer Sessions.)

S 6b. House Decoration and Furnishing.—History of furniture; perspective drawing of rooms; color schemes; weaving. T. Th., 10, 11; W.B.; 1½ credit hours. Miss Hope

Prerequisite: Art and Design 1, Household Science 7.

Equivalent: Household Science S 6b may be taken as an equivalent for Household Science 3 by arranging for extra work with the instructor upon registration.

S 22. Home Nursing and First Aid.—General care of a patient; simple sick-room appliances; standard surgical supplies and bandages (Red Cross); bandaging. Text: Galbraith's *Personal Hygiene and Physical Training for Women.* Four weeks beginning June 18. Lecture with demonstration, M.Tu., 3; Laboratory W.F., 3, 4; W.B.; 1 credit hour. Miss Brooks

S 18a. Institutional Cookery and Marketing.—Lecture, M. W.F., 10; Laboratory, T.T., 9, 10, 11; W.B.; 2½ credit hours. Laboratory fee, $2.50. Miss Parsons

Prerequisite: A year's work of college rank with foods; a year of general chemistry; a course in general physiology.

Equivalent: One-half of Household Science 18. (The department plans to give to those having the prerequisites the two halves of Course 18 in alternate Summer Sessions.)

LIBRARY SCIENCE

(See special circular.)

MANUAL TRAINING

Associate Professor Griffith, Mr. Duncan

The courses in Manual Arts have been arranged to satisfy the needs of three classes of students who attend the Summer Sessions;

(1) superintendents, principals, and teachers in small schools who pursue the work with the idea of either teaching or supervising it; (2) manual arts teachers and supervisors who take more advanced courses to increase their knowledge and experience; and (3), to satisfy those students in other courses who take the work to enrich their experiences.

S 1. Theory and Practise of Teaching Manual Training in the Intermediate and High Schools.—History and theory of industrial education; typical schools and systems; schemes for the promotion of industrial education; organization of work; equipments, new methods and new materials. M.T.W.T.F., 8; Lecture Room, Wood Shop; 2½ credit hours.

Associate Professor Griffith

S 2. Woodworking.—(A course for teachers in the 7th and 8th grades and high schools.) Tools; joints; arts and crafts furniture; talks, papers, problems; notebook and bench work. M.T.W.T.F., 2-5; Wood Shop; 3 credit hours. Shop fee, $5.00.

Associate Professor Griffith, Mr. Duncan

S 3. Furniture Construction (for teachers who have completed S 2).—Construction of furniture; typical woodshop machines; advanced handtool work; elementary woodturning; woodfinishing. M.T.W.T.F., 9-12; Wood Shop; 3 credit hours. Shop fee, $5.00. Associate Professor Griffith, Mr. Duncan

MATHEMATICS

Professor Miller, Assistant Professor Emch, Dr. Wahlin, Dr. Chittenden, Mr. Frary, Mr. Borden, Mr. Richardson

Beginning with the Summer Session of 1917 the department of mathematics plans to offer at least five courses each summer for graduates and advanced undergraduates, and to vary these courses from year to year so as to enable advanced students to secure a suitable sequence of courses during four or five successive summer sessions. Three of these five courses are of an intermediate grade, being open to advanced undergraduates as well as to graduates, while the other two are primarily for graduate students.

The intermediate courses are for the present to be devoted to the following six subjects: Theory of equations and determinants, advanced calculus, constructive geometry, advanced algebra, differential equations, and advanced analytic geometry. It is proposed to give a course on each of these subjects every two years, beginning with the first three for the Summer Session of 1917.

The subjects of the graduate courses are as follows: Functions of a complex variable, introduction to group theory, theory of statistics, vector analysis, metric differential geometry, projective geometry, theory of linear differential equations, calculus of variations, and theory of numbers. The courses on these subjects will be quite distinct from those devoted to corresponding subjects during the academic year. They aim to exhibit some of the characteristic elements of these fields and to emphasize the bearing of these subjects on the more elementary developments in mathematics.

Mathematics Library and Models

The Mathematics Library now contains more than 6,000 volumes. Fifty current mathematical periodicals are received in addition to a large number of serials devoted partly to mathematics and available in the general Library. The Mathematics Library will be open to all students during certain hours of each day except Sunday, but graduate students in mathematics can secure keys which will enable them to use this library whenever the outside doors of the Natural History Building, in which it is located, are open.

A large collection of mathematical models is exhibited in cases located in the halls adjoining the mathematics recitation rooms and in the Mathematics Reading Room. This collection includes models relating to the following subjects: Quadratics of all kinds, surfaces of the third and fourth order, surfaces of higher orders and line geometry, curves in space, differential geometry, descriptive and projective geometry, analysis situs, mechanics and cinematics. It also includes devices and machines for mechanical computation, integration and harmonic analysis.

The department maintains a laboratory and drafting room, where students are given an opportunity to construct graphs and models illustrative of special questions involved in their regular courses.

Mathematics Club

The Mathematics Club will meet every Friday at 4 p. m. in Room 434, Natural History Building, for the consideration of mathematical questions of general interest, especially questions relating to the teaching and the history of mathematics. These meetings will be open to all the students who may be interested and will usually last for an hour.

COURSES FOR UNDERGRADUATES

S 2. College Algebra.—Text: Rietz and Crathorne's *College Algebra.* M.T.W.T.F.S., 10; 422 N.H.; 3 credit hours. Mr. Richardson

Prerequisite: Two and one-half units entrance mathematics.
Equivalent: Mathematics 2.

S 4. Plane Trigonometry.—Text: Taylor's *Trigonometry.* M.T.W.T.F., 11; 434 N.H.; 2 credit hours. Mr. Borden

Prerequisite: Two and one-half units entrance mathematics.
Equivalent: Mathematics 4.

S 6. Analytical Geometry.—Introductory plane and solid analytic geometry. Text: Wilson and Tracey's *Analytic Geometry.* M.T.W.T.F., 10 and 11; 418 N.H.; 5 credit hours. Mr. Frary

Prerequisite: Mathematics 2 and 4.
Equivalent: Mathematics 6.

S 7. Differential Calculus.—Course for beginners. Text: Townsend and Goodenough's *Essentials of Calculus.* M.T.W.T.F., 8 and 9; 425 N.H.; 5 credit hours. Dr. Chittenden

Prerequisite: Mathematics 6.
Equivalent: Mathematics 7.

S 9. Integral Calculus.—Text: Townsend and Goodenough's *Essentials of Calculus.* M.T.W.T.F.S., 10; 419 N.H.; 3 credit hours. Dr. Wahlin

Prerequisite: Mathematics 7.
Equivalent: Mathematics 9.

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

S 10. Theory of Equations and Determinants.—The roots of unity; the conditions which must be satisfied in order that a given system of linear equations can be solved. Text: Dickson's *Elementary Theory of Equations.* M.T.W.T.F., 9; 418 N.H.; 2½ credit hours. Professor Miller

Prerequisite: Mathematics 7, 9.
Equivalent: Mathematics 10 (in part).

S 17. Advanced Calculus.—Derivatives and differentials. Implicit functions; functional determinants; definite and indefinite integrals; improper and line integrals. Goursat-Hedrick's *Mathematical Analysis,* Vol. I. M.T.W.T.F., 11; 419 N.H.; 2½ credit hours. Dr. Wahlin

Prerequisite: Mathematics 7, 9.
Equivalent: Mathematics 17 (in part).

S 18. Constructive Geometry.—Geometric construction and the possibilities of graphic solutions of mathematical problems; the constructive and analytic aspects of inversion, stereographic, isometric, orthographic, and perspective projections; the construction of linkages for curve-tracing. M.T.W.T.F., 8; 432 N.H.; 2½ credit hours. Assistant Professor Emch

Prerequisite: Mathematics 6.

Equivalent: Mathematics 18 (in part).

COURSES FOR GRADUATES

S 120. Introduction to Group Theory.—Development of fundamental theorems in group theory; applications in other fields of mathematics; use of substitution groups for determining a necessary and sufficient condition that rational functions on n variables can be expressed rationally in terms of each other; some fundamental relations between elementary number theory and elementary group theory. The course will be based in part on Miller, Blichfeldt, and Dickson's *Theory and Application of Finite Groups.* M.T.W.T.F., 8; 418 N.H.; 1 graduate unit. Professor Miller

Prerequisite: Mathematics 7, 9, 10.

S 132. Projective Geometry.—Fundamental concepts; the problem of projectivity; construction of projective pencils, ranges, and conics; projective coordinates, transformations, and groups; polarity and correlation; pencils and ranges of conics; the involutory quadratic transformation. First part based on Lehmer's *Synthetic Projective Geometry.* For the more advanced topics the student will have opportunity to make use of a set of typewritten lecture-notes and works of reference. M.T.W.T.F., 10; 432 N.H.; 1 graduate unit. Assistant Professor Emch

Prerequisite: Mathematics 7, 9, and preferably a second course in algebra.

MECHANICAL ENGINEERING

Professor Goodenough

S 11. Thermodynamics.—Fundamental laws; gases and vapors; flow of fluids; problems in heat engineering. Text: Goodenough's *Principles of Thermodynamics.* M.T.W.Th.F.S., 10; 308 E.H.; 3 credit hours. Professor Goodenough

Prerequisite: Math. 9, 9a, or equivalent.

Equivalent: M. E. 11.

COURSE FOR GRADUATES

S 107. THERMODYNAMICS.—Fundamental laws; general equations of thermodynamics; investigations of the properties of heat media; special problems in physics and in engineering. Lectures and assigned readings. Tu.,Th., 1-3; 308 E.H.; ½ unit.

Professor GOODENOUGH

Prerequisite: A course in thermodynamics equivalent to M. E. 11 or M. E. 12.

MECHANICS, THEORETICAL AND APPLIED

Mr. ENSIGN, Mr. PUTNAM

S 10. HYDRAULICS.—Pressure and flow of water; its utilization as motive power; observation and the measurement of pressure, velocity, flow, power and efficiency; determination of experimental coefficients. Hoskin's *Textbook on Hydraulics.* M.T.W.T., 1; 202 App. Mech. Lab.; T.T., 8-10; Hyd. Lab.; 3 credit hours.

Mr. PUTNAM

Prerequisite: Theoretical and Applied Mechanics 21.

NOTE: Arrangements may be made to use the facilities of the hydraulic laboratory for special experimental work during the summer session.

S 20. ANALYTICAL MECHANICS.—The first half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* M.T.W.T. F.S., 10; 202 E.H.; 3 credit hours. Mr. ENSIGN

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 21. ANALYTICAL MECHANICS.—The second half of Analytical Mechanics as given in Maurer's *Technical Mechanics.* M.T.W.T., 10; 202 App. Mech. Lab.; 2 credit hours. Mr. PUTNAM

Prerequisite: Mathematics 9 and Theoretical and Applied Mechanics 20.

S 25. RESISTANCE OF MATERIALS.—The mechanics and properties of materials used in construction; experiments in the testing laboratory; problems. Merriman's *Mechanics of Materials.* M.T.W.T.F.S., 11; 202 E.H.; M.W., 8-10; App. Mech. Lab.; 4 credit hours. Mr. ENSIGN, Mr. PUTNAM

Prerequisite: Mathematics 9, Theoretical and Applied Mechanics 20.

MUSIC

(For fees, see page 10.)

Director Erb, Miss Treat, Mr. Nasmyth, Mr. Swinney

S 1. Musical History.—From the beginning of music to the Middle Ages. Collateral reference work and note books. M.T.W. T., 9; 126 U.H.; 2 credit hours. Director Erb

Prerequisite: The consent of the instructor.

Equivalent: Music 1.

S 2. Advanced Harmony.—Suspensions and modulations; modern harmony; harmonic analysis; keyboard work. T.T., 4; 126 U.H.; 1 credit hour. (This course will not be given unless there is reasonable registration for it.) Director Erb

Prerequisite: One year of harmony or the equivalent.

Equivalent: Music 5 (in part).

S 3. Harmony.—Intervals; scales; chord formation up to and including the dominant seventh; harmonization of basses and sopranos; harmonic analysis; keyboard work. M.T.W.T., 10; 126 U. H.; 2 credit hours. Director Erb

Prerequisite: The rudiments of theory.

Equivalent: Music 3.

S 4. Sight Singing, Advanced Course.—One, two, three, and four part reading; exercises for breath control, enunciation and phrasing. M.T.T.F., 2; 126 U.H.; 1 credit hour. Mr. Swinney

Prerequisite: Two years of sight singing or the equivalent.

Equivalent: Music 23a.

S 5. Sight Singing, Elementary Course.—Music notation; scale structure; ear and eye training; solfeggio. W., 2, F., 3; 126 U.H.; no university credit. Mr. Swinney

Prerequisite: One year sight singing or the equivalent.

Equivalent: Music 28a.

S 6. Public School Methods.—The technic of the teaching of public school music; analysis of material. M.T.W.T., 3; 126 U.H.; 2 credit hours. Mr. Swinney

Prerequisite: Two years of sight reading and the consent of the instructor.

Equivalent: Music 25a (in part).

S 41a-41f. Preparatory Course in Piano.—Arrange hours; 102 U.H.; no university credit. Miss Treat

Prerequisite: The consent of the instructor.

Equivalent: Music 41a-41f (in part).

S 42-46. Piano, Collegiate Grade.—Arrange hours; 102 U.H.; 1 or 2 credit hours. Miss Treat

Prerequisite: Three years of piano study.

Equivalent: Music 42-46 (in part).

S 47. Piano, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 102 U.H.; 1 credit hour. Miss Treat

Prerequisite: Three years piano study.

Equivalent: Music 47 (in part).

S 51a-51f. Preparatory Course in Voice.—Arrange hours; 101 U.H.; no university credit. Mr. Nasmyth

Prerequisite: The consent of the instructor.

Equivalent: Music 51a-51f (in part).

S 52-56. Voice, Collegiate Grade.—Arrange hours; 101 U.H.; 1 or 2 credit hours. Mr. Nasmyth

Prerequisite: Three years of vocal study.

Equivalent: Music 52-56 (in part).

S 57. Voice, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 101 U.H.; 1 credit hour. Mr. Nasmyth

Prerequisite: Three years vocal study.

Equivalent: Music 57 (in part).

S 81. Organ.—Arrange hours; 121 U.H.; 1 credit hour. Miss Treat

Prerequisite: Three years piano study or the equivalent.

Equivalent: Music 81 (in part).

S 82. Organ.—For students in other schools and colleges of the University. Arrange hours; 121 U.H.; 1 credit hour. Miss Treat

Prerequisite: Three years piano study or the equivalent.

Equivalent: Music 82 (in part).

Students desiring to take organ will be obliged to pass without conditions the entrance examination for collegiate standing in piano.

Campus sing every Wednesday evening at 6:45, Auditorium steps.

PHYSICAL TRAINING FOR MEN

A. ATHLETIC COACHING

Director Huff, Mr. Gill, Mr. Jones, Mr. Zuppke, Mr. Bilik

Note: Courses in Physical Training for men will continue through only 6 weeks. Not more than 5 credit hours in physical training may be counted for graduation in any one of the colleges of the University.

S 10. Baseball.—Batting; base running; fielding each position; team work and coaching; rules; physical condition; indoor practise. Lectures; practical work. M.Tu., 10-12; W.Th., 8-10; 1½ credit hours. Director Huff

S 11. Track and Field Athletics.—Starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; preparing contestants for different athletic events; individual peculiarities; rules; physical condition, including endurance, speed, fatigue, and means of training; promotion, management, and officiating of games and meets. Lectures; practical work. W.T.F.S., 10-12; 1½ credit hours. Mr. Gill

S 12. Basketball.—Coaching; passing; goal throwing; dribbling; team play; condition; the different styles of play used by leading coaches. Lectures and practical work. M.T.W.T., 1-3; 1½ credit hours. Mr. Jones

S 13. Football.—*Theoretical:* Rules from the standpoint of coach, players, and officials; offense and defense; generalship and strategy. *Practical:* Training; conditioning; equipment; punting, drop kicking, place kicking, kick off, and forward passing; tackling dummy and charging sled; special drills for linemen, ends, and backs; following the ball, interference, and team work; fundamental plays, freak plays, and signal systems. Lectures and practical work. M.T.F.S., 8-10; 1½ credit hours. Mr. Zuppke

S 14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S 10, S 11, S 12, or S 13. F.S., 1; ½ credit hour. Mr. Bilik

B. GYMNASTICS

Mr. Fargo, Mr. Seitz

S 15. Calisthenics.—Typical lessons for corrective and responsive work. Simple drills with wands, Indian clubs, and dumb-

bells. (a) Imitation and command; hygienic work; large classes. (b) Second three weeks a continuation of same in conjunction with practise teaching. M.Tu.W.Th., 11; Gym.; ⅓ credit hour.

Mr. Fargo

S 17. Elementary Gymnastics; Heavy Apparatus.—Heavy apparatus, mats, horse, horizontal bar, rings, and parallel bars. M. T.W.T., 5-6; Gym.; ½ credit hour. Mr. Fargo

S 18. Intermediate Heavy Gymnastics.—More advanced work along the same lines as Course S 17. M.T.W.T., 5-6; Gym.; ½ credit hour. Mr. Fargo

S 19. Advanced Gymnastics; Heavy Apparatus.—Heavy apparatus; nomenclature; skill, form, and accuracy. M.T.W.T., 5-6; Gym.; ½ credit hour. Mr. Fargo

Note: Courses S 17, S 18, and S 19, will be given at the same hour. Students registered will be placed in whatever grade of work they seem to belong, according to former experience and ability.

S 21. Gymnastic Dancing for Men.—Elements of steps, simple steps, and series of dancing steps to be given to classes in single file, pairs, and in open order. M.T.W.T., 3; Gym.; ½ credit hour.

Mr. Seitz

S 23. School Room Gymnastics.—Exercise for elementary grades and high school. M.Tu.W.Th., 4; Gym.; ½ credit hour.

Mr. Seitz

S 24. Anthropometry.—Physical measurements; sources of information; preparation of statistics. All students will be required to present graphic charts of records taken by them. F., 2; Gym.; no credit. Mr. Seitz

S 25. Physical Examination.—Methods of detecting physical defects of the interior organs as well as exterior form and action; examination of hearts and lungs. F., 3, 4; Gym.; no credit.

Mr. Seitz

PHYSICAL TRAINING FOR WOMEN

Miss Moulton and Miss ———

S 1. Plays, Games and Folk-Dances.—For teachers who coach high school girls in team games or supervise grade school games; comparative values of ball games; folk-dances and singing games; lectures and practise. M.W.F., 3-4; W.B. 1 credit hour.

Miss Moulton

S 2. School Hygiene and Sanitation.—M.W.F., 11; W.B. ½ credit hour. Miss Moulton

S 3. Gymnastics.—Swedish and German systems; elementary gymnastic steps, etc. M.T.W.T.F., 2; ½ credit hour.

Miss Moulton

S 4. Aesthetic Dances.—Technic; advanced folk-dancing, etc. Tu.Th., 4; ¼ credit hour. Miss Moulton

S 5. Swimming.—Instruction in small groups. M.T.W.T.F., 11, 2, 3, 4; no credit. Miss ———

PHYSICS

Associate Professor Watson (in charge), Associate Professors Knipp, and Kunz (special lecturers), Professor Hornbeck
Mr. Hyslop, Mr. Fazel, Mr. Booth, Mr. Nelson

S 7 I. General Physics Part I.—Mechanics; motion; forces and their effects; equilibrium. Text: Kimball's *College Physics.* M.W.F., 11; Lecture Room 119, Physics Building; 1½ credit hours.

Associate Professor Watson, Mr. Nelson.

Prerequisites: Plane geometry and high-school algebra; registration in Physics S 8 I. Plane trigonometry desired.

Equivalent: S 7 (I, II, III) together with S 8 (I, II, III) are equivalent to Physics 7a-7b, 8a-8b for the college year.

S 8 I. Introductory Laboratory Physics Part I.—Physical measurements on mechanics, properties of matter, to accompany S 7 I. Text: Schulz's *Laboratory Manual.* M.W.F., 2-4; 212 Physics Building; 1½ credit hours. Mr. Hyslop, Mr. Nelson

Prerequisite: Registration in Physics S 7 I.

Equivalent: See S 7 I.

S 7 II. General Physics Part II.—Electricity and magnetism. Text: Kimball's *College Physics.* T.T.S., 11; Lecture Room 119, Physics Building; 1½ credit hours. Dr. Hornbeck, Mr. Nelson

Prerequisites: See S 7 I.

Equivalent: See S 7 I.

S 8 II. Introductory Laboratory Physics Part II.—Laboratory to accompany S 7 II. Text: Schulz's *Laboratory Manual.* T. T., 2-4; S., 8-10; 112 Physics Building; 1½ credit hours.

Mr. Fazel, Mr. Nelson

Prerequisite: Registration in S 7II.

Equivalent: See S 7 I.

[S 7 III. General Physics Part III.—Heat, light, and sound. Text: Kimball's *College Physics.* One and one-half credit hours.

Given in 1916; not given in 1917; will be given in summer of 1918.

Prerequisite: Same as S 7 I.

Equivalent: See S 7 I.

[S 8 III. Introductory Laboratory Physics Part III.—Laboratory to accompany S 7 III. Text: Schulz's *Laboratory Manual.* Given in 1916; not given in 1917.

Prerequisite: Registration in Physics S 7 III.

Equivalent: See S 7 I.]

S 4. Electrical and Magnetic Measurements.—Discussions, recitations and reports. M.T.T.F., 1-4; 112 Physics Building; 2 credit hours. Mr. Fazel

Prerequisite: A course in general physics and calculus.

Equivalent: First semester of Physics 4.

S 15. Electricity and Magnetism.—Lectures, recitations, and laboratory. Text: Brooks & Poyser, *Magnetism and Electricity.* M.W., 8; F., 1-4; 108 Physics Building; 1½ credit hours.

Mr. Fazel

Prerequisite: A course in general physics.

Equivalent: Physics 15 (in part).

S 16. Heat.—Fundamental heat phenomena; thermometry; calorimetry; expansion; vapor pressure. Text: Edser's *Heat for Advanced Students.* T.T., 10; W., 1-4; 213 Physics Building; 1½ credit hours. Mr. Booth

Prerequisite: A course in general physics.

Equivalent: Physics 16 (in part).

S 17. Light.—Reflection; refraction; interference; diffraction and polarization. Theory and use of optical instruments, such as telescopes, microscopes, refractometers, prism and grating spectroscopes, interferometers. Text: Houston *A Treatise on Light.* W. F., 10; M., 1-4; 208 Physics Building; 1½ credit hours.

Dr. Hornbeck

Prerequisite: A course in general physics.

Equivalent: Physics 17 (in part).

S 18. Teachers' Course.—(1) Discussions of methods of organizing laboratory work; quizzes; demonstrations; criticisms of high-school text-books; principles of selecting and ordering apparatus. (2) Practical laboratory manipulation; glass blowing, mi-

nor repairs of apparatus, preparation of direction sheets, etc. T.T., 8; 208 Physics Building; 1 credit hour. Mr. Hyslop

Prerequisite: A course in general physics, or teaching experience in physics.

Equivalent: Physics 18 (in part).

S 19. Advanced General Physics.—Selected topics in general physics for teachers. Text: Watson's *Textbook of Physics*. T.T. S., 10; 208 Physics Building; 1½ credit hours.

Associate Professor Watson

Prerequisite: A course in general physics; trigonometry.

Equivalent: Physics 19 (in part).

S 21. Recent Advances in Physics.—Popular experimental lectures on recent and important advances in physics. The lectures will be public and may be attended by those interested. One hour credit may be obtained by presenting brief abstracts of the lectures and by writing a short examination on the main facts presented. Lecturers and subjects are as follows: Dr. Knipp, "Discharge of electricity through gases"; Dr. Kunz, "The electron theory"; Dr. Watson, "Acoustics of auditoriums"; Dr. Hornbeck (subject to be announced); Mr. Hyslop, "Wireless telegraphy and telephony"; Mr. Fazel, "Radiation"; Mr. Booth, "High temperature measurements". T.T., 4; 100 Physics Building; 1 credit hour.

Consult Dr. Watson or Mr. Hyslop for details.

Course for Undergraduates and Graduates

S 31. Special Problems in Advanced Physical Measurements.—Arrange time; 1 or 2 credit hours.

Associate Professor Watson, Dr. Hornbeck

Prerequisite: A course in general physics, calculus.

Courses for Graduates Only

S 126. Physics Colloquium.—Biweekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems. Attendance is expected of all graduate students. Undergraduates who are especially interested in physics as teachers or otherwise, are advised to attend. Thursday, 6:45-8:00 p. m.; 201 Physics Building.

Associate Professor Watson, Mr. Hyslop

S 131. Investigation of Special Problems.—

Associate Professor Watson.

S 133. Seminar and Thesis.—

Associate Professor Watson

POLITICAL SCIENCE

Assistant Professor Dickinson, Mr. Cushman

S 3. State and Local Government.—Powers, obligations, and rights of the states in the Federal Union; development and nature of state constitutions; organization of state and local government; political methods. M.T.W.T.F., 2; 306 L.H.; 2½ credit hours. Mr. Cushman

Prerequisite: Thirty hours of University work or the consent of the instructor.

Equivalent: Political Science 3 (in part).

S 11. Constitutional Aspects of Social and Economic Problems.—The nature and limitations of the police power; the police power of the national government; legislation concerning public health, morals, and safety; labor legislation, control of combinations of capital; regulation of public service companies. M.T.W.T.F., 3; 306 L.H.; 2½ credit hours. Mr. Cushman

Prerequisite: Six hours of political science or economics.

Equivalent: Political Science 11 (in part), or the consent of the instructor.

S 6. International Law.—Nature and sources of international law; its sanctions; international persons; rights and duties of international persons in time of peace and as modified by war and neutrality. M.T.W.T.F., 8; 317 L.H.; 2½ credit hours. Assistant Professor Dickinson

Prerequisite: At least junior standing, with six hours of history or political science, or with the consent of the instructor.

Equivalent: Political Science 6.

S 7. International Politics.—Conflict of national interests and policies in the Near East, the Far East, Africa, and Latin America; methods of conducting foreign relations; growth of international organization. M.T..W.T.F., 9; 317 L.H.; 2½ credit hours. Assistant Professor Dickinson

Prerequisite: At least junior standing with six hours of history or political science, or with the consent of the instructor.

ROMANCE LANGUAGES

FRENCH

Professor Oliver, Mr. Carry

S 1a. Elementary Course.—Pronunciation, grammar, composition, reading of easy texts. Aldrich and Foster's *Elementary*

French, and the same authors' *French Reader* will be the introductory textbooks. M., 9; T.W.T.F., 8, 9; 117 L. H.; 4 credit hours. Professor Oliver

Equivalent: French 1a, or one year of high-school French.

S 1b. Elementary Course (continued).—M.T.W.T.F.S., 10; 211 L.H. 4 credit hours. Mr. Carry

Prerequisite: French 1a, S 1a; or one year of high-school French.

Equivalent: French 1b.

S 2a. Reading of Modern French.—Rapid reading of modern authors, composition, conversation. Texts: Malot, *Sans Famille;* Augier et Sandeau, *Le Gendre de Monsieur Poirier;* Erckmann-Chatrian, *Le Juif Polonais.* M.T.W.T.F.S., 10; 211 L.H.; 3 credit hours. Mr. Carry

Prerequisite: One year of university French or an equivalent.

Equivalent: Three-fourths of French 2a.

Note: Students securing a grade of 85 or more who desire to earn one additional credit hour so as to make this course the full equivalent of French 2a of the regular university course, may do so on approval of the instructor and by fulfilling additional requirements of assigned work. Purpose to ask for additional credit must, however, be indicated at the time of registration.

S 6. Conversation. — Speaking and writing simple French. As a basis for conversation Bierman and Frank's *Conversational French Reader* will be used. M.W., 11; 117 L.H.; 1 credit hour. Mr. Carry

Prerequisite: The approval of the instructor. A good knowledge of French grammar and an ability to read ordinary French prose will be the basis of his judgment.

Equivalent: French 6a.

S 7. Composition and Conversation (intermediate course).—Conducted in French. Lyon and de Lorpent, *A Primary French Translation Book.* T.T., 11; 117 L.H.; 1 credit hour. Mr. Carry

Prerequisite: Ability to understand spoken French, and the approval of the instructor.

Equivalent: French 7a (in part).

S 24b. Eighteenth Century Drama.—Lectures and reading of plays by Voltaire, Marivaux, Lesage, Piron, Sedaine, Beaumar-

chais. Collateral reading of additional plays and of literary criticisms. M.W., 10; 117 L.H.; 1 credit hour. Professor Oliver

Prerequisite: At least two years of university French, or an equivalent, and the approval of the instructor.

Equivalent: French 24b (in part).

COURSE FOR GRADUATES ONLY

S 100. Seminar.—An opportunity for graduate work in French literature will be afforded for properly qualified students. Arrange; 214 L.H. Professor Oliver

SPANISH

Mr. Lopez

S 1a. Elementary Course.—Grammar, reading of easy texts. Coester's *Spanish Grammar;* Espinosa's *Elementary Spanish Reader.* M., 9, T.W.T.F., 8, 9; 211 L.H.; 4 credit hours. Mr. Lopez

Equivalent: Spanish 1a, or one year of high-school Spanish.

S 2. Conversation, Composition and Reading.—The vocabulary of every day life; commercial correspondence. M.W.F., 11; 211 L.H.; 1 credit hour. Mr. Lopez

Prerequisite: One year of university Spanish or its equivalent.

SOCIOLOGY

Professor Hayes

S 1. The Principles of Sociology and Their Application to Present Problems.—T.W.T.F., 9; 306 L.H.; 2 credit hours. Professor Hayes

Prerequisite: Junior standing, or equivalent.

Equivalent: Sociology 1 (in part).

S 7. The Social Problems of the Rural Community.—W.F., 11; 306 L.H ; 1 credit hour. Professor Hayes

Prerequisite: Sophomore standing or equivalent.

Equivalent: Sociology 7 (in part).

COURSES FOR GRADUATES AND UNDERGRADUATES

S 3. Social Evolution.—Modes of social activity among savage, barbarous, and civilized people; family organization, practical arts, economic wants and institutions, origins of government and law, codes of morality, religions; inductions from such facts, as to

the theory of social evolution and the method of progress. T.W. T.F., 10; 306 L.H. 2 credit hours. Professor Hayes

Prerequisite: Sociology 1.

Equivalent: Sociology 3 (in part).

COURSE FOR GRADUATE STUDENTS

S 100. Bases of Social Theory.—Time to be arranged; ½ unit. Professor Hayes

Equivalent: Sociology 100.

ZOOLOGY

Professor Smith, Doctor Van Cleave

COURSES FOR UNDERGRADUATES

S 1. General Zoology.—Animal biology; structure; function; inter-relations, development, generalizations. Lectures, field trips, laboratory, and recitations. M.T.W.T.F.S., 10-12; 312 N.H.; 4 credit hours. Laboratory fee $2.00. Dr. Van Cleave

Equivalent: Zoology 1 (in part).

S 4. Invertebrate Morphology.—Structure and development of a series of invertebrates. Lectures, recitations, laboratory. W.F., 8-11; 310 N.H.; 2 credit hours. Laboratory fee $2.00.

Dr. Van Cleave

Prerequisite: Zoology 1 or an equivalent.

Equivalent: Zoology 4 (in part).

COURSE FOR GRADUATES AND ADVANCED UNDERGRADUATES

S 17.—Field Zoology.—Collection, preservation, and identification of representatives of types of animal life, common in the vicinity (excluding insects). Field and laboratory work, lectures and assigned reading. T.T.S., 8-12; 310 N.H.; 4 credit hours. Laboratory fee $1.00.

Professor Smith

Prerequisite: One year of college zoology and junior standing, or an equivalent.

Equivalent: Zoology 17.

COURSE FOR GRADUATES ONLY

S 117. Faunistic Zoology.—Taxonomy and distribution. Field and laboratory work; literature involved; conferences. Arrange time; 321 N.H.; ½ to 2 graduate units. Laboratory fee $1.00 per half unit. Professor Smith

Location of the University of Illinois

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, on the main Chicago-New Orleans line of the Illinois Central, the station being Champaign. The Wabash and the Cleveland, Cincinnati, Chicago & St. Louis ("Big Four" of the New York Central Lines) railroads have stations in both cities. The cities of Urbana and Champaign have together a population of 29,000.

The institution was incorporated February 28, 1867, under the name of the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred thirty-six acres, besides a farm of about nine hundred fifty acres. The buildings at Urbana are fifty-one in number, chief of which are the Agricultural Building, the Agronomy Buildings, the Armory, the Astronomical Observatory, the Auditorium, the Beef Cattle Building, Central Heating Station, the Chemical Laboratory, Physical Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, the Farm Mechanics Building, the Horticultural Building, the Law Building, the Library Building, the Laboratory of Applied Mechanics, the Mechanical Engineering Laboratory, Men's Gymnasium, the Metal Shops, the Natural History Building, the Pumping Station, University Hall, the Woman's Building, the Wood Shop, Foundry, Commerce Building, Transportation Building, the Gymnasium Annex, Stock Pavilion, Administration Building, Vivarium Building, and the Ceramics Building. The School of Education Building, the Smith Memorial Music Building and the Women's Residence Hall are under construction.

Libraries

The University library, at Urbana, contains 347,000 volumes, and subscribes for over 3,400 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 8,700 volumes and 44,000 pamphlets.

The library is housed, for the most part, in the library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

Athletics

Although both the men's and women's gymnasium will be used in some parts of the regular class work in Physical Training, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums contain swimming pools, shower baths and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts, general athletic fields, and golf course on the University campus are open to the student body.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make lodgings and boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $4.25 to $5.00 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

For further information on any matter connected with the Summer Session, address the Registrar or

THE DIRECTOR OF THE SUMMER SESSION,
304 University Hall,
Urbana, Illinois.

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June 18 to August 10, 1917

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